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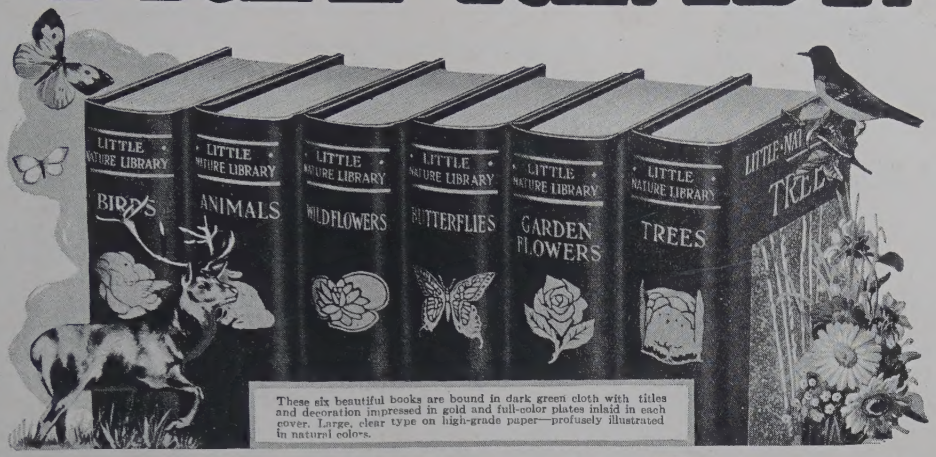
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Photographic Notes

BY SAMUEL BROWN

The photographic section of NATURE MAGAZINE is designed to be of service to its readers interested in photography, in particular Nature photography. All are invited to submit any problems or questions, which will be handled with dispatch. Any suggestions with respect to the conduct of this department will be welcomed by the editor.

In sharp contrast with summer, winter with all its snow and coldness brings to us a limited field for outdoor photography. However, it does provide a chance to photograph those things of which we seldom think. That beautiful case of butterflies; that mounted bird and those cases in the museum become at this time appealing subjects indeed.

Strange as it seems, no equipment is inadequate. With the proper knowledge the humble box and single lens cameras will give results favorably comparable to those by the most expensive precision outfit. For photography of this nature the greatest amount of control is possible, and with panchromatic film or fast orthochromatic film it is possible to secure the detail and delicate gradation that help to make a fine picture.

The reflections of the glass exhibit cases will usually spoil the appearance of a picture of scientific nature. We must, therefore, manipulate the lighting so as to elim nate any reflection in the camera lens. A an added check on glare, or reflection, r move the camera and place yourself in i former position, your eyes where the len had previously been. If no reflection or gla is apparent, it is safe to take the picture A handy means of reducing unnecessar glare is to shield the lights with ordinar tissue paper.

It is *always* advisable to use as small stop as is practical. In the case of inanimat objects this is a simple matter because th exposure it is possible to give is not limited Close your diaphragm to its smallest ape ture and expose accordingly. In single len folding cameras the smallest opening is usu ally F. 32. Since most box cameras hav only one stop, which is too large, it is bes to improvise a small one. This can easily b done by attaching a piece of black paper t the front of the camera and making a hol through it with a needle, at a point corre sponding to the center of the lens. This give an aperture requiring approximately ten t twenty times the exposure given with th smallest stop on a folding camera.

In a well lit room, i. e., a room l with a 100-watt bulb, and the subject abou six feet from the source of light, an ex posure of three minutes on a fast ortho chromatic film should give good results. I super-sensitive panchromatic film is used the exposure may safely be cut to from on to two minutes because "pan" emulsion are from two to three times as sensitive t light of mazda quality as "ortho" emulsions

Museum photography is a gratifying ex perience. We have the exhibits posed in thei most revealing and characteristic fashion, i their natural surroundings, so that a photo graph of an exhibit appears to be a pho tograph of an actuality.

Most museums do not permit the pho tographing of their subjects, but with a littl

PHOTOGRAPH OF THE RHINOCEROS IGUANA HABITAT GROUP AT THE AMERICAN MUSEUM OF NATURAL HISTORY IN NEW YORK, THE PHOTOGRAPH MADE BY TH EDITOR OF THESE NOTES WITH A ROLLEIFLEX

ct, special permission can usually be obined from the curator, provided sufficient roof is given that the pictures will not be sed commercially.

It is hard to give a general rule for phoographing in a museum because only the ght present can be used and that is someimes of such a color as to make an extreme ncrease in exposure essential. Then there re times when no matter from which angle ou look at the subject there are visible eflections. At such times, of course, the subects are not to be taken. The most interestng exhibits are usually in cases lit from he inside, with no light on the outside. aking these is an extremely simple matter. s a basis for figuring exposures, the illustations shown may be used. Both of them ere taken at F. 8 and exposed for 30 seconds on a fast orthochromatic film. Single ens folding cameras have a rating of F. 11 nd will require one minute exposure. With box camera two minutes will be necessary.

Aquariums

There is always a keen sense of satisfaction in doing the difficult. Many times the eauty of home aquariums hold such a

A SMALL PICTURE OF THE PACIFIC MEXICAN SAILFISH HABITAT GROUP AT THE AMERICAN MUSEUM IN NEW YORK

ascinating interest and appeal that a few xposures of them are to be desired. With he exercise of a little care and consideration or the feelings of delicate marine subjects nd the use of a fairly fast lens, the difficulties become negligible.

During the day, placing the subject before window and photographing through the vater will give good results. These may be isappointing, however, if the fish are not ransparent, because then they will appear s black silhouettes. For suitable subjects, n a bright day expose at F. 6.3, 1/25 second on a fast orthochromatic film.

With two photoflood bulbs placed one n each side of the subject and shaded from he lens, an exposure of 1/50 second on a ast orthochromatic film at F. 6.3 will give fully timed negative. It is advisable to turn n the lights at a distance from the subject nd then advance with them slowly, in order o get the fish accustomed to the intense ight.

Photoflash bulbs must be used with aution because the suddenness and intensity f the light has been known to scare the life ut of some fish.

The pictures on this page were taken with Rolleiflex camera and are reproduced with he courtesy of the American Museum of Natural History, in New York City.

Cordially,
SAMUEL BROWN.

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THE WATERFOWL SEASON

As this issue is being printed the last full month of the open season for waterfowl shooting in the United States is well under way. December will see the close of the hunting in two-thirds of our states. In the remaining one-third there is yet to follow a week or two of intermittent rest days and shooting. In our neighboring commonwealths of Maryland and Virginia, and in a few other southern states, January 12 or 13 will be the closing days of a shooting season that for sheer heartlessness, and utter disregard of all principles of conservation has not been equalled since birds first merited protection.

It would be well for the self-respect of the people of North America if the present shooting season were to be the last, but we have no hope that this will be the case.

Cessation of the destruction of a vanishing race of wild creatures, however beautiful these may be, when their destruction involves the disbursing of millions of dollars each year, is too much for the Nature-lovers of the continent to expect. The selfish minority, the killers who spend this money, are in the saddle, and articulate. An apathetic majority, including millions who love wild creatures alive, and who expend each year infinitely larger sums just to see these wild things in their haunts, have not yet organized their mighty influence. When it is too late, and this time will not be long in coming, they will sadly regret their vanished opportunity.

The non-killing Nature-lovers of America lack militant leadership. There are several organizations with nation-wide influence and vast possibilities for the fulfillment of needed conservation, but not one of them has yet put out, and lived up to, a clear-cut program that boldly and without equivocation places itself on the side of harassed wild creatures. Perhaps some one of them will yet see the light, and follow it to its source in the hearts of the wild-life lovers of North America. Let us hope that such leadership will arise, and that the time may soon come. If all of those who love our wild things, but who believe that mercy is better than persecution, could realize their power, they would be galvanized into a forceful activity that would banish for all time a long list of destructive methods that are now legalized. The effectiveness of the influence of the non-killers is constantly challenged by those who, for one reason or another, prefer to ridicule and oppose them. But they have a clean record, and must not lose heart. Judged even by the money standard, they are potentially powerful.

A report of a special Senate Committee on conservation of wild-life published in 1931, states in part:

"Your committee finds convincing evidence of a rapid disappearance of wild life." **** "We find that while there has been a steady decrease of game and game fish, there is a corresponding increase in the number of hunters and fishermen. **** A conservative estimate **** of the number of people in the United States who have actually either fished or hunted during the year 1929 would be 13,000,000. **** The total expenditure of the citizens of the United States in their quest for outdoor recreation in shooting and fishing alone during 1929 would doubtless amount to fully three-quarters of a billion dollars.

"These estimates concern only those values realized in the pursuit of wild birds, animals, and fishes for food and sport. By far the greater proportion of Americans who annually go afield to enjoy our wild-life resources and associations of out-of-doors, do not either shoot game or catch fish for sport. But all of them, nevertheless, are interested in wild life. Their numbers are annually increasing. **** It is impossible to estimate, even approximately, the tremendous sums annually invested and spent by this vast group of recreationists who are attracted by the ennobling and inspirational qualities associated with all varieties of wild creatures and their environment, but when figures are compiled they will dwarf any totals so far presented in connection with the activities of fishermen and hunters."

It is often claimed by those who minimize the usefulness of the efforts of Nature lovers to protect wild-life that they are ignorant of conditions. We do not kill harmless and beautiful and harassed wild creatures, but we stand on the side lines and see the procession go by, and we believe that we see more of it than do some of the players who make the noise. We read the letters of bewildered observers who miss the honk of the wild geese that used to greet them from October skies. We hear the plaints of those who read the Federal notices of the yearly lessening ranks of the waterfowl and other game birds, but who do not suspect the influences that prevent the passage of protective laws that match their needs. We read the demands of the ignorant and selfish gunners who claim that the laws and regulations discriminate against them and their localities. We note the rebellious attitude of those who resent restriction of what they term their "rights"—rights that involve robbing all of us of *our* rights. We are assailed by those who claim that we are attacking the time-honored sport of hunting, but who are incapable of understanding that sitting in a blind, and shooting helpless waterfowl that have been lured to their death in the baited pens by the antics of captured birds of their own kind, though it may have legal sanction, is *not* hunting, and *cannot* be sport. We read the indignant comments of those who learn that millions of the birds are killed each year, and that with them other millions escape among the rushes, winged or body-shot, and suffer for days the lingering death from pain and starvation beside which sudden stopping of life from the shot is mercy itself.

Make no mistake—we know conditions. Sometimes we almost envy those who possess the blind faith of the unthinking, but we repent and return to the battle, for we are here to fight for wild-life against any odds. And while we fight, we await a leader, and reinforcements.

ALASKAN PINE GROSBEAKS ON A MOUNTAIN ASH

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BRANCH LIBRARY
No. 23
C. P. L.

Arctic Visitors of Winter

Bird guests of the Northland who come to Montana, Land of the Shining Mountains

By JOHN LINDSEY BLACKFORD

Illustrated by R. Bruce Horsfall

Snow crystals like resplendent jewels were drifting slowly down through the dazzling sunlight of a clear, cold, January afternoon. At each step I crushed myriads of these tiny works of art. Where the path turned was a dark pool whose spring water had defied the frost. On its surface, as in reality, every evergreen was attired in the latest snowfall, each hawthorn and willow bough trimmed with sparkling white. Back among the birches I had thought myself in a fairies' boudoir.

A few strides beyond the trees and I stood at the doorway of our house. Then I noticed that Laddie, my inquisitive young collie, had found something beneath a sunroom window. He was the puzzled discoverer of a recent tragedy. On a snowbank stained with a few drops of his crimson blood, lay a bird of princely plumage, apparently dead; as I lifted him in my hand his carmine tinted body felt limp and warm; the wings were flexible but the rosy head fell back in an unnatural way.

A Rocky Mountain pine grosbeak? —yet this bird differed from the migrating flocks of grosbeaks that descend from the Hudsonian zone, high up on our western mountains, to pass the winter in the wooded valleys. Upon the head, breast, and rump was a similar suffusion of carmine-rose and pink, the wings beautifully marked with two white bars, the abdomen flanks and undertail coverts being a slaty gray. But upon the back the feathers were strikingly marked along their centers in dark brownish hues rather than the characteristic faint tracing of dusky. The general color of scapulars, wings and tail was brownish gray, while the under coloration of the plumage was a smoke gray. I held in my hand an Alaskan pine grosbeak!

Speeding down from the balsams on the hill, the bird had sought to cut across a corner of the many-windowed room. Darkness had closed in an instant upon that bright, beautiful world, and he lay, like a painted warrior, dead upon the snow.

Studying him thus, his death seemed unreasonable and wrong. From northwestern Alaska he had journeyed two thousand miles in safety only to perish ignobly here against a windowpane. Better it were some useless human life, I thought, than this proud *voyageur*.

The olive and yellow coats of the female Alaskan pine grosbeaks, contrasting with those of the males, present a pretty picture as they feed sedately upon seeds of the scarlet mountain ash berries. Occasionally from one of the group there comes a clear, melodious, rolling warble. They will make a cheerless morning into a cherished memory.

Their gay coloration produces a showy, almost tropical effect, which is enhanced by the turgid, parrot-like beaks. It were as if when coloring the tropics in their gorgeous hues, pigments from the Painter's brush had splashed upon the northern forests, and the Great Spirit, intrigued with the contrast, had breathed into them the ecstasy of Life.

The crossbills belong to that single genus of the finch family that alone possesses the peculiar adaptation to feeding habits that their name implies. The white-winged crossbills, the feathered nomads of the North, have for many of us a new lesson in our study of migrations. While there may be a general drift with the seasons the principal determinator of their movements is the cone supply. They may be here in abundance one year and not seen again for several years thereafter. Neither do the white-wings have any fixed breeding area; they simply nest where springtime overtakes them. Let me take you to where I saw a flock just yesterday holding winter carnival. Bring sandwiches, and binoculars too, if you have them; the quarry are more active and shy than the common crossbills, and we may not return until nightfall.

REDPOLLS, WINSOME WAIFS, ARE PICKING AND DUSTING OUT THE TINY SEEDS OF BLACK BIRCH AND ALDER

Our path this frosty morning leads up the course of a large stream winding away from the foothills. There is no sound to be heard save the swish-swush of snowshoes and an occasional soft gurgle from the imprisoned water beneath our feet. As the hills draw in closer, however, our ears catch the growing tumult of angry waters. The banks narrow as progress is made up stream, and we find ourselves in a small rocky gorge some fifty feet in depth at its lower end. There is a safer way of clambering up along the steep slopes and around the canyon but the water is low and we choose to walk the rim ice at its edge. With snowshoes on back and poles in hand to test the ice, our party proceeds. Bushes rooted in the joints and bedding planes of the sedimentary rock afford handholds; and convenient footlogs, left by high water, may be used to cross the torrent when it shifts to our side.

Let us pause and admire the stream in its winter setting. It sounds as though the dark waters, now free from icy bondage, were challenging anything that might seek to hold them again in thrall. With hoarse roarings the creek gathers its forces and races madly down precipitous rapids and cascades, or with wildly tossing waves goes surging from cliff face to cliff face and back again. Leaping and tumbling it presently falls with dull thunder into some deep basin in the rock whose black green currents boil and circle and submit grudgingly to the ever encroaching ice that has spanned the pool's lower lip. Then the stream rushes forth again in a frenzy, maddened by its temporary defeat, to rip and tear at the stolid boulders amid stream and sends spume hurtling high against the enclosing ramparts. The walls of the gorge are worn and weather-stained, but lovely. Where there is sufficient protection the rocks are decorated with a fine filigree of moss and lichens. A few cliffs present new surfaces where jagged boulders have been spalled off by the frost. Another time and we will spend the entire day in the canyon; today we are searching for a multi-colored band of busy cone-seeders.

Fortunately they are soon discovered in a clump of young fir. Here above the canyon the creek is a still white pathway threading through heavy timber. The birds are near by on the hillside, and at first sight they appear as gay colored bangles hung on Christmas trees.

Like true gypsies their garb is of many hues. The males wear rose-red not infrequently tinged with orange-chrome in summer; wings and tail are black with two white bars on the former. The females, on body and head, are grayish olive overlaid with olive green or dull saffron yellow, everywhere streaked with dusky; their wings are more dusky than black and the white wing bands flash conspicuously as the flock rises together, circles down the slope and drops like a shower of bright confetti upon the branches of a hemlock.

In sportive fashion they trail each other from tree top to tree top, festooning the boughs of spruce, fir, tamarack and pine as they industriously examine the cones. Focus your glasses on the bird hanging head downward. It is a young male, and you can readily see how subdued are his colors, they being tinged with olive and heavily streaked on back and under parts with grayish.

We follow the aerial procession mimicking their chattery *cheep cheep cheep* with ludicrous imitations of our own.

It will not be long until nesting begins, with incubation started before the snow is gone. The nest is an aromatic little cradle in the arms of some conifer. The color display does not end with the birds, for the eggs are a beautiful pale blue spotted around the larger end with sepia, black and lilac.

The flock is away now over the tree tops, and as we bid the white-winged crossbills goodbye it is with a feeling of real comradeship for these contented, intrepid wanderers.

Returning home we trudge along in an empty creek bed. From its overhanging gravelly bank comes a wisp-like trail of a weasel, and I hope that unlike ourselves he was not on the lookout for western tree sparrows. Negotiating another thicket, we cross an abandoned clearing where in summer weeds grew rankly between the blackened stumps.

A gay tinkling little song reaches us from a cluster of brown stalks on the far side. The winter sparrow is there with a dozen of his fellows, thriftily gleaning weed seeds from the plant store houses. Whether the sun shines with feeble warmth, or snow comes pelting down, these sprightly little Spartans are there saving the farmer many hours of toil. In driving winds and on bleak fields they find life worth while; in this they can teach us many a needed lesson.

The tree sparrow, who, by the way, spends most of his time on the ground, is another sojourner from the polar lands. In him we have one of our few winter vocalists.

The sun is setting behind a sea of clouds. Only a few dying rays penetrate the gray mass, staining its undersurface with colors like the patina on old metals. The clouds drift, the colors run together, the day fades and is gone, never to be farther away than "just yesterday."

When blizzards come to bury the stunted knee-high willows, the sedges, the white and cream reindeer moss, and the deep green and brown peat mosses of the Arctic tundras, the Alaskan longspur leaves his home land to seek a refuge on the plains of our western states. There his flocks may be seen as they skim over the ground in zigzag flight, dropping to the snow wherever forage offers, and stooping low like broods of partridge chicks when approached.

The longspur is a handsome bird on reaching the northern lands in April, and explorers tell that his song is the most beautiful sound to be heard by the polar sea. Rising on glad wings from some grassy tussock the songster glides to earth again, pouring out rapturously a flood of liquid music. Even in the most forsaken places Nature has apparently provided compensations.

A head and breast of pure black, offset by a broad buffy stripe behind the eyes, and a nape patch of chestnut rufous affords a splendid ensemble. The back is brown marked with black; the sides are streaked with the same color, with under parts white.

In company with this Arctic virtuoso may be seen another of our cold weather guests. The Alaskan horned lark, himself an accomplished soloist, is one of the many geographical forms of that widely distributed species of lark. From November to April the Alaskan variety replaces other horned larks who are summer residents only.

To Montana there comes also an avian Alpinist, a traveler from the regions of perpetual snow; for it is the world of the snow line that is beloved of the beautiful Hepburn rosy finch, mountaineer extraordinary, who dwells above timber edge on the western Alaskan and Canadian ranges. On banks of névé, on barren outcrop, on glacial moraines, and on talus slopes he may be discovered diligently garnering seeds and chilled insects brought by the strong winds to the higher levels.

When summer gales whip about the peaks he merely retreats to the lea of ice block or boulder and warms his toes, to sally forth again as the storm blows itself out.

After the hoary marmot's clear whistle no longer echoes between

SNOW-BUNTINGS MEET THE BITTER COLD WITH A GAY BRAVADO AND WORK UNDAUNTED AMID THE STORM

the heights, after the great brown and the grizzly bears are fast asleep, and when most other migrants have passed to the south, the Hepburn rosy finch arrives to meet with his cousins, the gray-crowned rosy finches, who have been flocking down from above timberline on our western mountains.

"In the vicinity of Butte, Montana", writes Mrs. Jay King, bird-lover and authority, in a letter discussing the Hepburns, "I have observed great numbers of the rosy finches; one huge flock must contain approximately five hundred birds, the majority of them gray crowns. Many find shelter in an old, abandoned mine shaft one and one-half miles west of the city. I feed them all winter with suet, dry bread crumbs, oatmeal, birdseed and other suitable food; and more than once I have counted over one hundred in my yard at one time. They are so tame that when my small daughter sits on the steps they feed all about her feet.

"The finches", she adds, "have not only the spirit but the ability to successfully drive English sparrows, which are numerous, away from the food."

The Hepburn rosy finches, Mrs. King relates, arrive in this portion of the state in mid-November and reside here until the middle of March. The altitude of the Butte area is around 5700 feet.

When snowflakes come swirling down from gray skies, it is with no little emotion that we wait to greet their namesakes, the snowflakes or snow-buntings. Soon their aerial regiments appear to grace our wind-swept winter hillsides, prairies, and fields. Working undaunted amid the storm-smother, meeting the bitter cold with gay bravado, they win our hearts on first acquaintance, these brave little adventurers from the top of the world.

Each is a feathery fluff ball of almost pure white, marked with black above, and stained at this time of year with sienna on crown and upper parts.

Their breeding grounds extend across all North America beyond Hudson Bay and includes, besides, the islands of the Archipelago to within at least eight degrees of the pole. No list of polar explorers, it is fair to say, would be complete without mention of the snow-buntings.

The North is not sterile. Here is living proof of the Arctic's power to create, evidence that the Titanic forces which made her are not too inanimate, too aboriginal to work in the finer arts. These bright spirits are of an *essence vitale,* alchemized from the sparkle of glaciers, the purity of never melting snows and the bloom of summers effervescent with flowers.

Since the Montana moon set two hours ago I have been in the timber. Here among the black birches I pause to behold the sunrise. The sky is clear save for a bank of cloud mist drifting toward the eastern horizon. The clouds begin to glow, become incandescent, turn a flaming pink. For a few ecstatic moments the glistening snow crust is tinged a faint crimson, the silver stems of the aspen and the trunk of a white birch a delicate shell pink, a pond glimpsed through the trees seems to have a bed of glowing embers beneath its placid surface. Then the sun's radiant disk peers over the eastern hills, rose becomes silver, and the rhapsody in pink has passed.

My attention is caught by a closely packed flock of small birds moving in swift undulating flight over the treetops. They wheel as at command and drop among the branches at no great distance. Other intentions are forgotten as I renew old friendships among the redpolls.

The winsome waifs are picking and dusting out the tiny seeds of black birch and alder catkins; already the snow has the appearance of having been liberally sprinkled with black pepper. Many of them capped with red, their breasts washed as with the sunrise, are descending from their perches, like winged peach petals fluttering down. What a jolly crew they are; the cheeriest most lighthearted troop of merrymakers that ever flew across the Circle.

I seated myself upon a log but twenty feet away, and with a charming trust in me they approached as they fed to within half that space. One cannot visualize a redpoll by himself; he is always to be thought of in happy crowds, displaying the heartiest good fellowship. They engage in constant small conversation, occasionally chasing one another about playfully. After about fifteen minutes they arose, calling their flight signals and were off over the trees. They came curving back again executing their air maneuvers expertly as they settled once more upon the lacy branches of a birch tree.

I followed and observed them dangling acrobatically, many seeming to prefer the tipmost catkin, which is, of course, the hardest to reach. Each red-capped caller from the North sports a rosy suit striped below with brown, the whole upon a body color of buff and gray. The coloration, including the roseate breast, turns paler in winter.

In addition to the common redpolls or linnets, Montanans are hosts, though rarely, to three other varieties: the Holboell, the greater, and the hoary redpoll. The first is a vacationist to our country from Greenland.

In Colorado the redpolls range to ten thousand feet on the snowclad mountains, and in Alaska remain during the severest winters. Despite their gentle natures, they, too, are gladiators against the cold, these happy, cheery, rollicking redpolls.

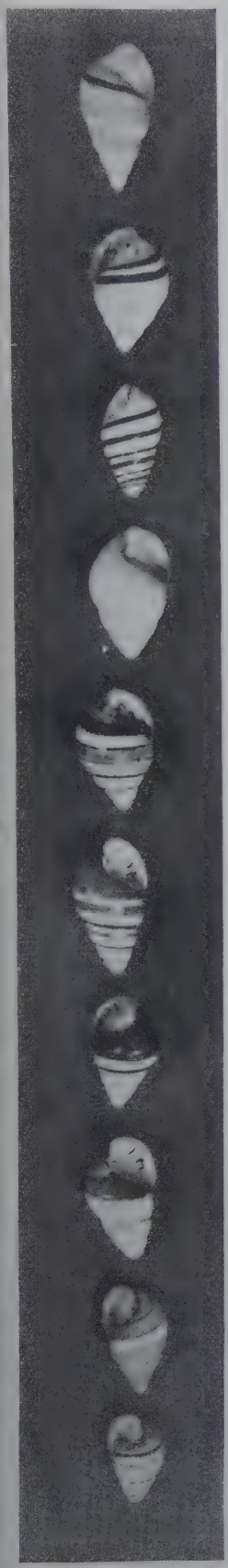
With the departing snows go also our bird friends from the Arctic and we turn again to greet the round of the seasons. Spring enchantress, beguiler, Calypso of the seasons; her flowers flirt with us along the trails; her arias are in the throats of all the birds. Summer—languorous daughter of the sun; her clouds go rolling from hill crest to hill crest like giant tumbleweed; warm air and humming insects lull to drowsiness; nights are a purple curtain momentarily lowered then drawn aside. Autumn—golden haired *artiste* with palette and magic paints tinting her murals. And then winter again, a titan in icy mail before whose white holocaust of storm our feathered visitors come to us.

And so, whether it be that forest prince, the Alaskan pine grosbeak, those courageous wayfarers from alpine heights, the Hepburn rosy finches, or the happy-go-lucky little redpolls, we shall welcome them again, each and everyone, back to the Land of the Shining Mountains.

ROYAL SNAILS OF HAWAII

The sport of collecting land shells on the Pacific islands

By MAJOR CHARLES L. STEEL, U. S. A.



HAWAII, the Paradise of the Pacific, has long been famous for the multiplicity and variety of the sports offered to its residents and to the itinerant visitor to its sunny shores. While this is applicable to all of the Islands, it is on Oahu that swimming, surf riding, fishing, hiking, golf, tennis and yachting reach their peak.

Here too may be found the little known but fascinating sport of collecting Hawaii's beautiful land shells. To the uninitiated the pursuit of the lowly snail may not appeal as a particularly sporting proposition, but a day's trip into the mountains with a seasoned snail hunter will go a long way toward dispelling that illusion. The Hawaiian snails are of royal blood and choose their abode in the high places. Seldom are they found at an elevation of less than fifteen hundred feet and from that height on up to four thousand feet they live and have their being. Nor are they satisfied with merely leaving the lowlands and living in the hills, but they must raise their plane of existence still higher. Scorning their plebeian cousins of drab, uninteresting hue, who crawl about and leave slimy trails on the brown earth, these lovers of the higher altitudes live in trees, clinging closely to the under side of the leaves or crawling slowly over the bark of the trunk and branches. The collector of land shells must hike far and hard before he reaches his collecting grounds.

Collecting grounds for tree snails in Oahu consist of any forested area, fifteen hundred feet above sea level and up, where the virgin forest has not been too badly cut out and which forest fires have never swept. The snails are born, live and die in definitely localized colonies, sometimes never leaving their natal tree. They are found almost exclusively in the trees indigenous to the Island—the kukui, lehua, mokihana and lahala—and rarely on introduced trees and shrubs, such as the guava and lantana.

The shells are not easy to find. The collector must depend on keen eyes alone to detect his quarry. Perhaps a green and brown striped snail is securely tucked away in the center of a close bunched cluster of lehua leaves swinging some fifteen feet above his head. Even after the shell is located it may be a long way from being in the bag. Of course many shells are found on low growing trees and shrubs, or on the lower branches of larger trees, and may be picked from their resting places without difficulty, but it seems as though the most beautifully marked shells, or the largest ones, are always high in the tree or out on the tip end of the slenderest branches. So up the tree goes the collector in true Tarzan style. After much climbing from branch to branch, accompanied by strenuous puffing and grunting, he cautiously slides out along a slender, swaying limb until the ominous cracking behind him warns him that he has passed the safety limit. And still the shell is just out of reach. So wrapping both legs around the limb he slowly and carefully bends the end of the branch inward with one hand until he can reach his trophy, and with his other hand he detaches the shell and thankfully climbs back to safety.

SOME OF THE LOVELY SNAIL SHELLS FROM HAWAII'S MOUNTAINS
At the left a group in which the lighter background predominates and, at the right, shells of darker hue with a wide range of color and only the brighter shades of red being absent. The shells shown here are approximately life size and from the author's collection

Frequently the story doesn't have a happy ending. Often, as the branch is being pulled in, the brittle wood snaps and the sudden jar dislodges the shell which falls in a flashing arc into the waist-deep staghorn fern or tangled undergrowth that carpets the ground. When this happens the disappointed shell hunter may as well swallow his chagrin and look for another snail, for not once in a hundred times can the shell be found after it has fallen into the twisted maze of vines, ferns and spreading brush that grow in Oahu's mountain forests.

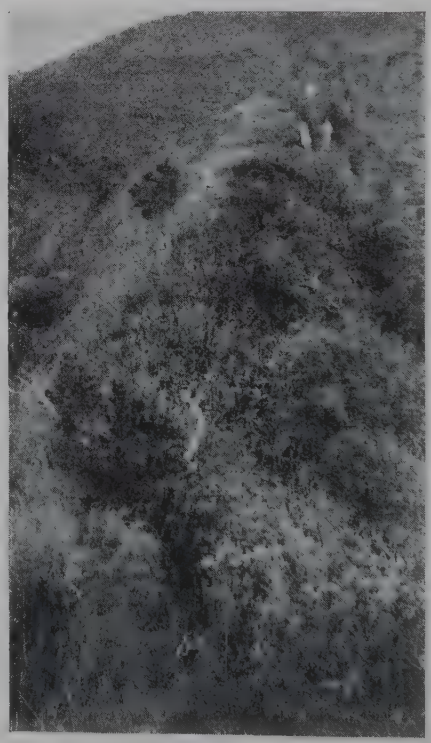
Sometimes the snails are found on the gray-green bark of kukui nut trees. Here they are collected by means of a small bag fastened to the end of a long bamboo pole. The method of procedure is to slide the long pole along the bark until the shell is dislodged and falls into the bag. The pole is then lowered and the shell recovered. Sounds easy, but it becomes a ticklish business when one is maneuvering the pole with one hand, clinging desperately to the tree trunk with the other and struggling with both feet to maintain a precarious balance on the side of a hill which slopes away so sharply as to seem almost straight up and down. And so, with alternating good luck and bad, the day wears on until the shell hunter has secured as many specimens as he desires or the fast dropping sun warns him that he had better call it a day and hit the back trail if he does not want to be caught in the mountains by darkness.

Weary but triumphant the collector arrives home and spreads upon the table the spoils of the chase. And as the contents of the bag are emptied, it is as if flashing jewels were pouring forth, shining and gleaming with all the prismatic colors of the gloriously vivid Hawaiian rainbow. In shape the shells are typical spiral cones, some short, and broad at the base like a top and some long and slender, but all cones and all spiral. In size they vary from the tiny auriculellas, a bare eighth of an inch from apex to base, to some forms of *Achatinella* that measure a full inch and a quarter over all.

It is not the shape nor the size, however, that give these shells their irresistible charm. It is their marvelous coloring. In solid colors they range from purest gleaming white through most of the shades and tints of yellow, rose, green, blue, purple and brown to the deepest midnight black. In color combinations they put to shame even the brilliantly colored tropical fish, which flash in and out of the coral reefs like living jewels. They come in markings of white and black; cool tones of apple-tree green and pearly white; pastel shades of soft gray and blue and yellow; bold black stripes like a tiger painted on a fawn background; rich, dark mahogany with white spirals and tips; warm, glowing Scotch plaids of green and brown; royal purple bands in a white and golden yellow setting, and so on and on through combinations and blendings of colors that beggar description.

THE AUTHOR'S WIFE COLLECTING

She had the thrill of finding a shell never before discovered. Below, a ridge in the Waianae Mountains, a fruitful snail collecting grounds



The patterns depicted by the colors are almost as diversified as the colors themselves. The striped shells vary from those with a fine penciled line spiralling from apex to base, so faint in color as to be barely discernible, to the ones having broad sweeping bands which cover almost the entire shell. Others bear double, triple and even quadruple rings of varying widths. In some the stripes run but half way, fading into white or brown or green, while in others the bands of color encircle the entire shell from top to bottom. The snails that prefer to clothe themselves in plaids instead of stripes also let their fancy run free in selecting their dress. There are those who appear in a brown and green design of quarter-inch squares that look like dark jade inlaid in highly polished walnut. Their neighbors from a nearby ridge show a decided preference for a more quiet suit of small dove gray and slate blue checks. In still another locality is found a race who decorate their shells with heather and mauve cross lines so fine as to seem etched, the whole encircled with spiral hair lines of coral red, a most pleasing arrangement. Truly the trophies that a shell collector can display are well worthy of attention.

It is not to be assumed that all these shells of many hues are to be found in the same location. Far from it. It is a fact that sometimes entirely different shells may be found in the same locality, even in the same tree, but

A COLLECTION OF THIRTY OF THE HAWAIIAN LAND SHELLS
This is a comprehensive and representative group and shows the variation in size, shape and marking. Practically all are fully matured and shown here about three-fourths life size

this is the exception rather than the rule. The Koolau mountain range, which extends along the eastern coast of Oahu from Kahuka to Makapuu Point, is some forty miles in length and varies in width from two to ten miles. Due to the bountiful rainfall the entire range is heavily forested and, probably for the same reason, is cut by innumerable deep gulleys and stream beds into hundreds of ridges. These ridges usually start off from the main backbone in a more or less perpendicular fashion.

Most of them before long break up into lesser ridges that run in every direction and, in turn, finally divide into countless fingers that eventually descend to the sea or else run out into insignificant foothills in the broad corridor that forms the central plateau of the island. Each of these individual ridges, lesser ridges and fingers has its own particular snail, found in that vicinity and nowhere else. Furthermore, on some of the longer main ridges, six, eight and sometimes more, distinct varieties are found between the beginning of the forest and the crest of the backbone ridge. Some idea of the infinite variety of shells to be found in these mountains may be derived from this brief description, and when this total is swelled by the numerous totally different races to be found in the Waianae range it may readily be understood why Oahu is for shell collectors a happy hunting ground beyond compare.

The Bishop Museum, located in the picturesque grounds of Kamehameha School, in Honolulu, maintains a magnificent collection of several hundred thousand shells. Key collections have been arranged for given areas which show the various shells found therein. Other key collections contain only shells of one species but show all the varieties and sub-groups found in that species. These collections are invaluable in quickly identifying and classifying any particular shell. The authorities are more than glad to assist amateurs in classifying their collections and encourage them to bring their shells to the Museum for this purpose. In return it is customary to donate to the Museum a small percentage of the shells collected, together with information as to the exact locality found. This information is necessary in order to further the Museum's self-imposed task of compiling accurate, scientific data as to the distribution of the hosts of snails found in Hawaii. Besides aiding the Museum in its stupendous work, the collector gains a comfortable satisfaction in having his shells correctly listed and arranged for display.

Once in a long while there comes to one the tingling, soul-stirring thrill of taking into the Museum a shell never before collected. Such a thrill fell to the lot of the author's wife. A shell was found by this ardent amateur that was not only new to the Museum but which is believed to be a connecting link between the snails now extinct by virtue of the destruction of the forests they once inhabited and the present-day shells now found in adjacent territory. The shell is now in the Bishop Museum collection, another bit of data added to the world's scientific lore and a never-to-be-forgotten thrill to its finder.

Snail collecting on Oahu is probably in its heyday at

the present time. Many shells once found in abundance are now extinct and many others are rapidly becoming so. Reproduction is slow. Unlike so many lower forms of life that lay eggs by the million, these snails bring forth their young alive and one at a time. This fact, together with their inherent habit of spending their lifetime in one spot, makes it only too easy for the careless, over-eager collectors to wipe out an entire colony. A colony, once destroyed, can never be replaced. Despite this there are still plenty of shells in the Hawaiian mountains and it is to be sincerely hoped that the time will never come when one cannot indulge in this healthful and fascinating sport.

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The Cashew Nut

By KATHLEEN HILL BUCHER

HERE is one of Nature's tastiest freaks. Many have eaten it but few have seen it. It is the cashew nut, the fruit like a seed outside the fruit and the apparent fruit the swollen stem. And it is just as crazy looking as that sentence. What looks like the fruit and what we eat fresh off the tree or candied, is not the fruit at all. It is the stem swelled into a delicious morsel. The true fruit is an ugly little seed stuck on the outside lower end of the pretty edible part. This seems involved and it is, as we are accustomed to eating fruits and not their stems. When the fruit is on the tree it looks like a bell-pepper, with a dark little kidney hanging to it. When it is ripe it may be glossy red, cadmium yellow, or a combination of the two colors, depending on the variety.

This ugly seed, or true fruit, is the important part of the cashew and gives it its commercial value. The seeds are collected and toasted to remove the husks. The kernel inside is what is sold as the famous cashew nut. It used to have a fantastic value and only the exclusive candy makers imported it into the United States. Now it is an article of common importation, most being brought in from the Orient. Those that grow in Cuba are consumed locally.

On the Cuban hills around us there are many of these beautiful trees. They are round-topped, low and spreading and lovely to play in. When the hills are sere in dry season the cashew trees are generally a bright yellow-green giving a curious but grateful relief from the dry browns and dusty greens. They bloom near the end of the dry season and set the fruit so that when the rains come in the spring the fruit swells and matures in a miraculously short time. There are generally all stages of development from blossom to ripe fruit on the same tree. The flowers are borne in clusters but are insignificant in color and size. Most of them fall off without making fruit.

When I first came to Cuba, I ate a big yellow cashew which puckered my mouth so that I did not eat another for years. It was worse than a green persimmon. I would never have eaten another if I had not been begged to try a beautiful one which some boys had just gathered up in the hills and brought down strung on slender twigs. It was delicious and ever since I have regretted my years of prejudice, and the loss of so much good fruit. Every year I try to make up the loss but each year my regret is greater. The juice is astringent, highly flavored and scented and stains like indelible ink. The stain stays until the leaves fall from the trees, or as the Jamaican servants say, "until the fruit is out of fashion". I have packed away the children's stained blouses and table linens to find them free from stains some months later. I did not believe that until I had the proof in my own home.

An appetizing sweet is made from the pulpy ripe fruit by boiling it in sugar syrup and drying it in the sun. Preserves and jam are made also, but it is most often stewed with lots of sugar.

The cashew is native of America, its name being *Anacardium occidentale*. Most of the members of the *Anacardiaceae* are poisonous. The husk of the seed is said to be poisonous. I do not know this from experiment but I do know that the oil of it will burn the lips like fire and make blisters. When the seeds are roasted on a sheet of zinc over an open fire an acrid smoke comes off which irritates the eyes and nose. The nuts when husked are rich and sweet, and have that attractive and sometimes dangerous quality of causing one to "eat with a coming appetite".

The Bluffer of the Fields

By PERCY A. MORRIS

THE hog-nosed snake, variously known by such formidable names as "flat-headed adder", "puff adder", "blowing viper", "spreading adder" and "red adder", is generally regarded as an extremely dangerous serpent, while in reality it is one of the most harmless and gentle of snakes.

They are fond of sunning themselves in dry sandy places, or plowed fields, and when discovered are usually far from cover. They lack the speed of most snakes, their short, stubby build precluding the possibility of escape by that method. Being entirely unequipped for fighting, they find themselves in the same predicament as the fat man who could neither fight nor run away, and so the hog-nose does the same thing his human counterpart did—attempts to bluff it out.

When discovered, the snake makes no effort to retreat, but erects his head, which he flattens out into a broad triangle, takes an enormous breath which inflates the body to twice its normal size, and then expels this breath with a sharp hiss which can be heard for several rods. If approached too closely, the mouth flies open and the reptile strikes repeatedly at the object of its disturbance. A more fearsome looking creature would be hard to imagine, and beside him an angry rattlesnake would appear gentle by comparison.

In spite of his threatening attitude, the snake is absolutely harmless, and cannot be induced to bite, even if you put your finger into his mouth. The sole object of its hostile antics is to frighten off the intruder and thus make escape possible. And this subterfuge often succeeds.

THE END THE SNAKE USES FOR A BLUFF

Here we see the turned up, swine-like snout of the harmless and useful hog-nosed snake

This bluff does not last very long. If he sees that you are not going to be frightened away, he has another stunt in his bag of tricks, which is to pretend death, or "play 'possum".

The snake will suddenly appear to be taken with a convulsion. The mouth flies open, and the whole body writhes in apparent agony, as he turns over on his back, thrashing the head from side to side until the inside of the mouth is covered with dirt. Then with a final quiver of the tail, he apparently dies. He can then be picked up and tied into a knot, flung upon the ground, or hung over a branch where he will sway gently to and fro in the breeze, without showing the slightest sign of life.

Like most bluffers however, he gives himself away by carrying it too far. If, while he is feigning death, you turn him right side up, he flops over on his back again with a speed that is positively comical. It is plain that to him an honestly dead snake should be belly side up.

If you keep quiet nearby, the snake will slowly raise its head after a few minutes and carefully gaze in all directions. If it sees nothing suspicious, it will turn over and wriggle off as fast as its sausage-like body will permit. Stand up and attempt to give chase, and the reptile flashes over on its back and becomes limp in "death" again.

It should be explained that these are the antics of freshly found hog-nosed snakes. After a moderate amount of handling they seem to realize the futility of further bluffing, and as a rule no amount of persecution will make them present their dying "act" again.

THE HOG-NOSE IN MENACING MANNER

If this fails to scare the intruder it will roll over and play dead

The hog-nosed snake averages a little over two feet in length, has a thick, stubby body, and a triangular head, with a distinctly turned up, hog-like snout.

The coloration varies considerably. As a rule the body color is some shade of yellow or brown, with an irregular pattern of large patches of dark brown or black upon the back, from the neck to the end of the tail. A row of smaller blotches on each side alternate with the larger ones on the back. The under side is greenish yellow. Specimens living in open dry places are usually a light sandy yellow, while those found in damp wooded sections are apt to be darker brown.

The hog-nosed snake feeds almost exclusively upon frogs and toads, seeming to prefer the latter. In captivity they take food readily, and soon become very tame. They are satisfactory snakes to keep for a while as pets.

A Stony Dinner Table

By NELLIE AUSTIN

A DINNER table all in natural stone, each article just as it was picked up in the hills—that is what you see above.

The teapot, sugar bowl, cream pitcher, cup, vase and vegetable dishes are of iron hematite, as are also the peaches and grapes. The grapes are a purple-black color and hard as flint. The grapefruit and melon are concretionary formations. Among the dishes of food we find drop cakes, queer little mud pieces looking like soft cookies run together in the baking. Although these are hard stone now, no doubt once they were soft before Nature baked them by her secret process. The loaf of bread is a water-worn, golden-brown piece of quartzite. The plate of round cookies or biscuits are of water-worn sand rock. The meat croquettes are hard and brittle sand stalagmites. Macaroni is a fossil of some kind, and it even has holes in some instances, like the real article.

The little black beans are made from pebbles washed and polished on some ancient seashore, then coated or colored outside by some unknown process. The inside of them, when they are broken, is grayish, pink, red or almost any color, while the outside is black. And they are exactly the size of the common black wax bean. All of the articles are the right size for a regular table. The walnuts are a replacement crystal from a mineral marcasite replaced by impure lime phosphate. This is a relic of the cretaceous period. The potatoes, cauliflower and dried raspberries are geyser formations, as also is a piece of rock looking like tapioca pudding. There has been added to the table since the picture was taken, bacon, tapioca and a little dish of after dinner pills (oolitic hematite), small round smooth pellets of stone. The picture shows a plate of sandstone, quite hard, but oblong in shape. These dinner plates are found piled up together layer upon layer, perhaps formed by whirling motion of water. The knife, fork and spoon are pieces of petrified wood. This table is shown in the Shell, Wyoming, Museum, and attracts a great deal of comment and attention.

We have now presented our rotogravure section four months, its fourth appearance being in the next sixteen pages. Next month we have other remarkable pictures in store. There have been many letters of commendation, indicating both enjoyment of this feature and appreciation of its practical uses in Nature study work. We welcome any comments or suggestions from our readers on this section and as to how we may make it more useful or interesting.

Cats and Cats

There are, indeed, cats and near cats, varied in size and appearance and forming one of the most interesting and widely distributed of animal families. Above, the camera has caught the "King of Beasts" in one of his most bored poses, or else saying "Ahhhh" for the doctor. At the right is an African genet, distinguished by its long tail. The genets resemble the true civets except in certain anatomical details. They are beautifully spotted or striped. They steal through the grass like weasels and live mainly on small rodents, snakes, eggs and birds. The genet has been tamed and successfully domesticated in southern Europe and is often kept as a rat catcher.

The Tiger is characteristically Asiatic. It is found nowhere else in the world, never coming, of its own accord, closer to Europe than the Caucasian side of the Caspian Sea. The Tigers of the north are all larger than those of India and are extensively sought for their furs. The Royal Bengal, however, is a truly savage and ferocious cat. It has been able to hold its own wherever Europeans, with their perfected means of killing, do not form a dominant part of the population. Photograph by Roberts.

In contrast with the ferocious son of the wild jungle above is the blooded domestic cat at the left. Yet in its blue and pedigreed blood there still lurks a drop or two of the wild. Centuries of domestication and selective breeding have produced this silken, purring pet.

Our own American mountain lion at the left looks down from a tree-top perch, while below we see William L. Finley, Field Naturalist of Nature Magazine, up in another tree to get a picture of this persecuted animal.

Above is the Pallas Cat of Tibet and India, one of the smaller members of the cat tribe. At the right is the Eyra Cat, the lowest and longest of the cats, an inhabitant of northern Mexico. It is readily tamed to make a charming pet. Below, at the right, is our own bay lynx or bobcat and, directly below, is the so-called ring-tailed cat or Bassaricus. This little animal is found in Mexico and some of our southwestern and Pacific states. It is an agile, shy and interesting little mammal, a good ratter. It enjoys living around human habitation although it does not lend itself to taming.

In the desert Nature has built an imposing column in the giant or Suhuaro Cactus. Here we see it crowned with its tubular, white-petalled flowers.

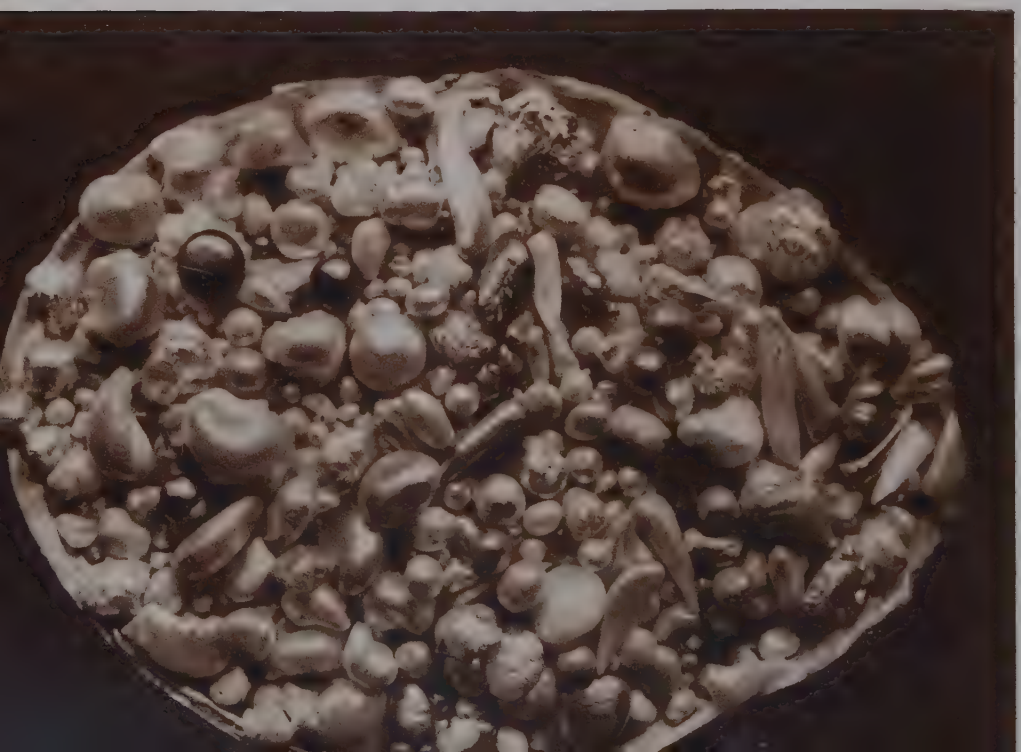
At the right is the lovely bloom of the night-blooming cereus, a member of the cactus family that reserves its beauty for the nocturnal hours. It is widely distributed in warmer climates and there are many species of Cereus, both native and developed. Photograph by John W. Weber.

A Goose Sextet

Above is the white-fronted goose of central and western North America which breeds near the Arctic coast and winters from southern British Columbia to southern California. Photograph by Frank Bond. At the right is the blue goose of eastern North America, whose breeding place has only lately been discovered. Photograph Canadian National Railway. Below is the Canada Goose, perhaps the best known of our geese. Photograph by Frank Bond.

At the right is the Barnacle Goose, photographed by Frank Bond, and, below, the Cape Barren Goose, photographed by J. A. D. Phillips. At the lower left is the western Snow Goose, a beautiful bird that is much persecuted. It is similar in color to the Greater (eastern) Snow Goose, but smaller in size. Both breed beyond the Arctic Circle. Photograph by Frank Bond.

A scene on the coast of California. Here we see a rocky cove at Midway Point on the famous eleven-mile drive near Del Monte. This is full of scenic thrills, with sea-weathered rocks washed with foaming breakers and many marvelous seascapes along the route.



A shell full of pearls and slugs gathered from clams taken from the Mississippi River. The value of the collection was once set at three thousand dollars. One can never tell what may be found inside the clam shell. Photograph by Cornelia Clarke.

Nature and the weather, working together, do many curious tricks and here are some instances of their combined talents at sculpture. Above, at the left, the horse seems to be clamoring to take the bit in its mouth and be away, while at the right a weathered root has taken on the aspect of an elephant's head and trunk, even to the canny eye of the pachyderm itself. Both of these oddities were photographed just as chance had left them.

Below are several amusing examples of root formation that form a part of an imposing collection of this kind of freaks. At the left is a figure described by the collector as "a visitor at the baths, sleek and well-fed, stroking his beard as he contemplates his surroundings." Next is a root-figurine titled "The Chained Devil." Note the three-fingered, talon-like hand which is distinctly unearthly. At the right, the slim individual displays a strange, long-fingered hand equipped with both fingers and thumb. None of these figures has been touched or trimmed, other than to supply Beelzebub with chains to keep him from stirring up trouble.

More freaks. Above, a fawn carrying a pumpkin on its shoulder. Next to him is a plump and well-fed bulbous person with a cloven foot. At the right is an odd bit of driftwood found on a Gaspé beach and named "The Dog." Below, weather sculpturing in rock.

Little is known of the life and habits of the mouse deer of Malay. About the size of a domestic cat, they are rare, and even rarer is an albino, such as the one shown above. These peculiar little animals are known by the Latin name of Tragulus javanicus. Their normal color is a reddish brown and their height at the shoulder is rarely more than twelve inches at the most. Photograph International.

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At the right is a tree kangaroo of Australasia. It is the most abnormal group of the Kangaroo Family and is known as the "boongarry" among the natives of Queensland. It is a clumsy, melancholy looking fellow, and although it seems to have been forced to arboreal habits either through persecution by enemies or in search of food, it is not an apt and graceful climber. It is rather slow and awkward, climbing and clinging with its sharp, long claws. It lives in the densest parts of the forests and scrubs of New Guinea and tropical Queensland and is extensively killed by the natives for food.

Some Hawks

Mother red-shouldered hawk inspects her nest at the left above. She is a valuable hawk, feeding mainly on rodents and other small pests and on insects. Photograph by Alfred M. Bailey. The two young broad-winged hawks above will grow up to be pleasing and valuable birds with a musical note to their call. The sparrow hawk at the left is one of the smallest and most attractive of the hawks, and feeds principally on insects. The red-tailed hawk is the one most often called hen-hawk, and while it occasionally preys upon poultry, it also eats rodents, reptiles, insects; its diet is about eighty-five percent of forms injurious to man. Below, the kestrel, English cousin of our sparrow hawk.

Desert Dwellers

Varied and interesting is the life of the desert. We have, above, the chuckwalla, a fierce-looking but a timid, harmless and defenseless inhabitant of the waste places. At the right rears the beautiful candle of the yucca to adorn the desert scene. Below, at the right, the dainty little kangaroo rat with his long and tufted tail, and his peculiar long hind legs that give him his popular name. And, below, a family of tiny verdins by their interesting nest, which they build among the thorn-covered twigs of desert bushes.

DOUBLE TRILLIUMS

The trillium is one of our loveliest wild flowers and one that should not be gathered but left in its natural state. Here the photographer, Jean Maitland, has found a lovely clump of double trilliums in all their delicate forest beauty.

Joshua trees in the Mojave Desert. Neither palm nor cactus, into one of which class the layman is apt to place them, they are really members of the Lily Family. Gaunt and twisted, often blackened with fire, these trees are symbols of the desert.

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The California Condor is the largest of our North American birds, and last of a line that traces their ancestry far back into prehistoric times. Their numbers have been so decimated that they are rarely seen. They deserve and should have greater protection, that they may not join the group of extinct American birds. Photograph by Finley.

TWINS IN THE CEDAR

A study of spider webs bejeweled by the dew.

Photograph by Hugh Spencer

Finny Fellows

The dainty little seahorse, above at the left, swims about with its body erect as in the picture, its motive power coming from the little fan-shaped fin at the rear. When it grips the stems of seaweeds with its tail and sways with the vegetation, it is very difficult to detect. Above is a little fish from the waters of India that builds a bird-like nest in which its eggs are laid. It has the ability quickly to change its color when an enemy approaches its nest, which is tightly woven of seaweed. At the left is the butterfly fish, a tropical with lovely filmy fins. It is *Pantodon buchholzi*. Below it is the flying fish of warmer waters. While this fish does not actually fly it is able to launch itself from the water and use its wing-like fins for gliding. Below is another tropical fish popular in aquaria. It is the spade-fish or *Chaetodinerus faber*, which is quite a name.

Some Moths

One of the hawk moths lights on an evening primrose. These moths are often called hummingbird moths because of a superficial flight. Their wings are usually small in comparison with their bodies, which are stout and tapered at the end. Photograph by Klugh.

Next we have the cecropia moth, its cocoon and eggs. This is a beautifully marked moth, numerous and with a range from the Atlantic to the Great Plains. Photograph by Cornelia Clarke.

At the lower left is the lovely luna moth, distinguished by its delicate green color which, unfortunately, fades to a light gray. Its larva feeds on a variety of trees. Photograph by A. A. Nicolas.

Directly below is a tiger moth and eggs. There are some two thousand species of these moths of which this striking fellow is an interesting example.

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Below is a female Promethea, one of our most beautiful moths. In the larva state it feeds on a wide variety of hardwood trees and shrubs. In its larva state, it is, perhaps, more beautiful than the mature moth.

Save the Sourwoods

By CLARA B. DEAN

Illustrated by Alma Alison

WHEN we decided to build on a woodsy lot in the Tennessee Valley several years ago we tried to select those trees that must be sacrificed. It was virgin timber and tall. Red oaks and white oaks spread their limbs above the other trees. The pines had only a few high branches but the tree trunks pleased us with their soft patches of new and old bark; peeling patches of gray and newer patches of rose and tan, colors reflected in the stones we were using in our chimney. The maples spread their good shade in the more open places. Smaller trees—the dogwood, the wild cherry—promised bloom for our pleasure and fruit for the birds. They were familiar trees and we saw their beauty.

There was one tree that we did not know. Tall, without obvious symmetry, in January its body seemed thin and gawky, twisted, impoverished. We were relieved that we might sacrifice a tree that meant so little to us.

Even so, it is hard to kill a tree. We delayed, consulted with our friends, and found ourselves eager to listen when an amateur landscape architect who had traveled abroad advised us to spare the fifteen sourwoods on our lot. In England, he said, sourwoods grew in the gardens. He insisted that we wait for its summer bloom and its autumn flame before we decided that this was a tree that we could sacrifice.

So we waited; we saw the sourwood in blooming time that summer and in flaming time the following autumn. We saw that it bloomed when other trees were hot and sick, long after the dogwood and cherry had lost their glory. We saw that its leaves turned early in the late summer and remained vivid red long into the winter. The sourwood had so won us that when winter came we liked its bare, lank body against the gray skies.

We studied the sourwood, reading what others had written about it, and found that its botanical name is *Oxydendrum arboreum*, that it is often called the sorrel tree, and that it is native to the Appalachians. Then we drove up into the Great Smoky Mountain National Park to see the sourwood clinging to the mountain slopes, its July bloom dominating the earthy smell of rain-soaked pine and hemlock, damp, humus-blackened earth, and rotting wood. We climbed through the forest of rugged trees, looking always for the slimmest and crookedest tree; and, finding it, we followed its light-seeking trunk to the tall umbrella of pointed leaves and frail blossoms. We saw the graceful, upward-curving racemes at the tip of every sourwood branch bearing pendant white bells, like lilies of the valley. We knew and were glad that we had joined those few initiates who had noticed and appreciated the sourwood in its habitat.

THE SOURWOOD BETWEEN TWO OTHER TREES

The slender trunk has no suggestion of force. It has twisted itself into the sun-filled space left between the force-driven limbs of larger trees

Henry Van Dyke believed that no inanimate thing could be so human as a small river. Perhaps that is true. But the sourwood seems very human in that it is "different" from other trees, it has a will and a purpose of its own. Its ways are not those of the large trees of the forest. Seeing it in the Smokies we felt that it had a deep kinship with those "old" mountains; that it was a child of the Appalachians in a sense that other trees were not. In the virgin forests of our Smoky Mountain National Park there are great trees, the oak and the hemlock and others of their kind. We are awed by their size and strengthened by their triumph in growing large on storm-swept slopes. We feel that they have fought the rains and winds for survival. But the sourwood is a tree of adjustment; true child of the Appalachians that have been rounded and soil covered through adjustment.

In the Appalachians bare rocks have weathered and formed waste slopes; thousands of years of weathering have changed the waste-covered slopes to rounded hilltops covered with thin soil; small, food-starved vegetation has contributed humus and made way for the spruce and hemlock, oak and hickory, and modest sourwood. These are gracious mountains, gently sloping and wooded, with grace acquired through long adjustment to erosion

and weathering. But they have a strength and an appearance of long survival that younger mountains lack, young mountains that thrust defiant peaks above the clouds, their steep slopes rejecting the rain and the sleet and the snow, great rocks from their sides crumbling and falling into deep valleys. On the forested slopes of the Appalachians erosion is slight and weathering assists the trees in building a deeper soil. The old mountains have learned the lessons and received the rewards of adjustment; they have found grace and strength.

So with the sourwood. The slender trunk of the sourwood has no suggestion of force. It has twisted itself into a sun-filled space left between the force-driven limbs of large trees. In the forest its long trunk is an aristocrat among the sturdy straight-growing peasant trees surrounding it, forcing but not conquering it. The limbs of the sourwood are not large; like small-boned arms of an oriental dancer they are an arc from trunk to upward-curving flower fingers. Yet its survival has demanded a strength that the sourwood seems to lack, if you judge by its slim body. Look at several trees and you will see that they often grow in pairs. Perhaps half the sourwoods in the forest are twin trees. If one trunk of the tree is killed the other continues its growth. Cut off the top of a sourwood that appears to be almost dead and it will send out a dozen healthy limbs and grow into a bushy tree. Chop down a sourwood and several trees will grow from the roots. Dig up a young sourwood (if your muscle and your patience last) and see how tough and strong its root system has become. It likes the dolomitic soil of the mountain coves or the cherty hillsides of the valley, but I have seen this sorrel tree growing courageously in the leached rederths of the Piedmont in Virginia and North Carolina or struggling, shrub high, in the sandy soil of the coastal plain. The sourwood has found grace and strength in its adjustment.

THE FLOWERS OF THE SOURWOOD
The pendant white bells, like lilies of the valley, bloom bashfully but beautifully

Like the mountains, too, this tree of the Appalachians has a changing beauty through the seasons. Modestly hiding its white blossoms in its tall branches in July, blatantly waving its bright umbrella in October, the sourwood is Quaker and Gypsy by turns.

In spite of its beauty, and perhaps because of its skill in adjustment, we have not cherished the sourwood. Only those of us who have followed the mountain streams with noses keen for fragrance and with eyes keen for grace of body and bloom know how beautiful the sourwood can be in its mountain habitat. Here in the valley, on our woodsy lot, it adjusts itself to our needs; growing into a bushy, symmetrical tree in cleared spaces; gracefully seeking for light between the oaks; blooming, flaming, thriving.

The trees grow tall above our house: the red oak and the white oak and the pine with its soft bark; many dogwoods and a few wild cherry trees have spread round patches of shade on the grass. We could sacrifice none of them. Between the tall trees and the small trees the sourwoods have their place. Each cycle of seasons renews our gratitude for our friend's advice: *Save the sourwoods.*

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WINTER experiments with flowers, and the early growing of many other plants for garden sets require the use of light rectangular boxes well put together to withstand soil moisture for some time. Many small discarded wooden boxes can be procured, but most of them are shallow, too light, and put together with glue, which precludes their

use. Old empty brick cheese boxes are, however, a most practical and very economical solution. They can be readily procured from any restaurant, grocery or meat market for a quite trifling sum, generally for the simple request for them in your own community. The boxes are just the right size and proportion, light but strong, easy to handle and work with and well nailed.

INDOOR GARDENING

Winter need not stop the growing of plants

By ROMAINE B. WARE

With King Boreas marshaling his hosts for the yearly battle he always wins, the flower lover in the North longs to bring the garden into the house. Indeed, if he would continue to enjoy growing flowers indoor gardening is the only answer over most of the country. And it need not be restricted to a few ferns, begonias and geraniums. These may have been about the limit a generation ago, but today the opportunities are increased. In the home of tomorrow, with its air conditioning, its solarium and other refinements, indoor gardening will doubtless reach heights undreamed of today. Phenomenal success with various house plants grown under electric lights has already been attained, and today you may buy pedestal and wall bracket lamp fixtures with plant holders built into them. They have proved both practical and artistic.

COURTESY THE TILE MANUFACTURER'S ASSOCIATION

AN INDOOR POOL ADDS MUCH

About it many indoor gardening activities may be carried on during winter months

Most flower lovers soon learn that growing conditions as found in a greenhouse are most nearly ideal. Comparatively few of us, much as we may long for it, can afford the pleasures of a greenhouse or conservatory. Modest units of these glass gardens are, however, quite reasonable today.

Probably the most extensive and elaborate glass gardens in the world are those at Longwood, Pierre du Pont's vast country estate a few miles west of Wilmington, Delaware. Here literally acres of flowers are growing to absolute perfection under glass throughout the full twelve months. And best of all, these gorgeous gardens at Longwood are open to the public without cost practically every day in the year.

Although indoor gardening on an elaborate scale is beyond the reach of most of us, all too frequently we limit ourselves to a few plants in a sunny window when there are many much more interesting schemes both practical and delightful.

Why not build a small pool in the brightest end of your sunroom with a tiny jet of a fountain? Can you not picture it banked with greenery, an umbrella fern at one end, the delightful parrot's feather trailing and cascading over the edge and primrose creeper with its waxy green leaves and yellow blossoms half submerged in the water. These and many other aquatics are suitable for indoor pools.

If you are still more ambitious, the pool may be surrounded by a small rock garden in which may be planted a variety of plants. The selection will be regulated largely by the amount of sunlight and one's ability to provide suitable atmospheric conditions. With sunlight and a humid atmosphere a much wider variety will be practical than in the usual dry air most homes tolerate during winter.

Maybe the pool idea appeals to you but there seems to be no place for one. The next best scheme would be a wall fountain with a tiny pool as the basin. Many times these may be placed in the corner of a room, or between two windows. I have seen them not only in sunrooms, but in halls, living rooms and dining rooms. Small ferns may be used in connection with them and make effective pictures.

Pools and wall fountains are frequently made of tile, an excellent material with wonderful possibilities due to the many styles, shapes and colors available. Where one builds a pool upon an existing floor, a rust-proof metal pan, placed upon some insulation board, should underlie the space to drain away possible leaking water.

Indoor pools are far from common, but if the simplicity of installation and their charm were better known, many more sunrooms would enjoy them. Located where sunlight reaches, a variety of aquatics may be grown. Even without sunlight, much plant life is possible.

If these schemes seem too pretentious and potted plants are more in keeping with your surroundings, why

not try to give them the best possible environment? One of the most convenient and practical plant stands is a metal-topped table with a rim a few inches high around it and equipped with large size, easy rolling castors. The top should be of rust-proof metal and provided with an inch layer of fine crushed rock or gravel on which pots may stand. Moisture evaporating from this table top will keep the air humid around the plants.

Another scheme with potted plants is to set them in ferneries and pack sphagnum moss all around them. By keeping the moss moist, the soil in the pots will not dry out as quickly. In similar manner single pots may be set in other pots a few sizes larger and the intervening space packed with moss.

Plants growing indoors thrive largely in proportion to the care and skill with which their wants are supplied. They demand ample but not excessive amounts of water at regular intervals. Flooding them one day and neglecting them for several days afterward does not foster success. Foliage plants can produce reasonably good results without direct sunlight, but flowering plants seldom bloom without it. All plants need fresh air and to be kept reasonably free from dust. Outdoors, natural rainfall and dew attend to this last requirement. Inside we must approximate these. Plants indoors resent drafts and sudden changes of temperature that frequently cause dropping of foliage.

Plants indoors, necessarily under artificial conditions, are frequently subject to disease and insect pests. These, however, may be controlled, provided they are recognized and treated in time. Aphids succumb quickly to several regular daily sprayings with any of the nicotine solutions. One application will not suffice as a new brood hatches out daily. Also, as results depend upon actual contact of the spray with the insects, care must be used to reach every part of the plants. The same treatment is used for white flies, which appear as tiny white specks flying around the infested plants.

When house plants become white or grayish, especially at the tips of the branches, red spiders and their larvae are frequently to blame. A daily spraying with plain water will generally rout them because dampness is their mortal enemy. Soap suds are recommended for scale and mealy bugs. Scrub the under sides of the leaves where they usually appear as white, waxy masses. Vigorous, healthy plants are seldom troubled by insects or disease.

Even should your space be extremely limited you will have room for one kind of indoor plant growing—the Japanese dish garden. The Japanese consider dish gardens or, bon-kei as they call them, works of art rather than toys. As they build them, miniature mountains, pools, meadows, bridges and buildings are represented, and their skill not only has to do with the dwarf plants but also with planning and producing the entire landscape in proportionate size. It is not uncommon to find tiny trees half a century old in their dish gardens. Propagated from the weakest shoots of slow growing species, they are grown in a bit of lean soil and carefully pruned to restrict growth, thus giving the effect of the Arctic.

Though we may not produce the true Japanese bonkei, much pleasure may be derived from making Lilliputian gardens, using small plants. It is even possible to obtain delightful effects with a carrot, beet or horse-radish cut obliquely to stand in a dish of shallow water together with some clinkers of various size and some tiny Japanese ornaments. This phase of indoor gardening has been so popular that a few years ago there was published a valuable book of more than two hundred pages, *Adventures in Dish Gardening* by Miss Patton Beard, whom many readers of Nature Magazine remember for her interesting article on the same subject in the October 1931 issue. If you have never made one of these delightful little gardens, you have a real treat in store.

There is another type of indoor gardening that may be indulged in by flower lovers anywhere and under almost any conditions. This is growing plants in a Wardian Case, or to use the more popular name, a terrarium. This is simply a miniature greenhouse which offers the necessary environment for successfully growing ferns and many otherwise difficult plants indoors. Within their limited space it is possible for plants to enjoy an even degree of humidity, and this is one of the great difficulties that must be overcome with anything grown indoors.

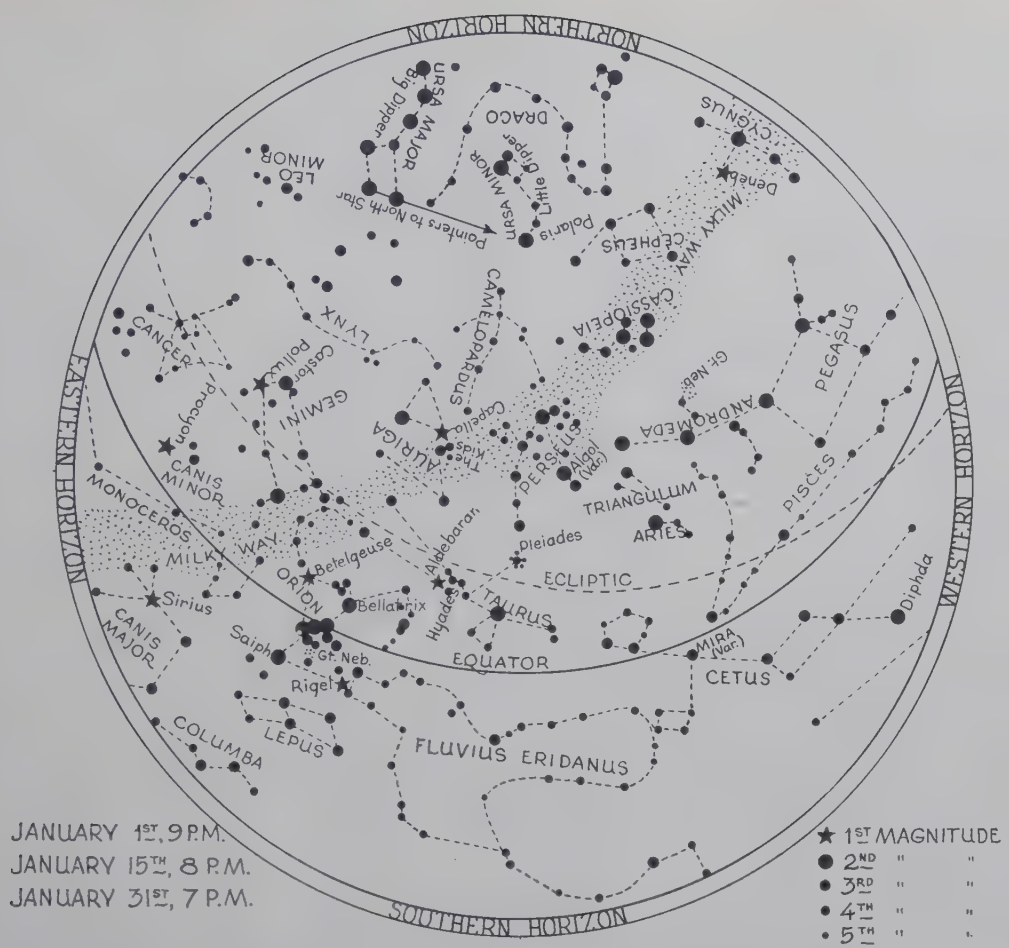
Many kinds of glass enclosures may be used for terrariums, such as a rectangular aquarium, a round fish bowl, or almost any glass container with a cover. One clever planting was made in a giant ten gallon bottle where everything had to go in through the small neck and be planted with a long pair of tongs. Here various kinds of ferns were growing including the common polypody, maidenhair spleenwort, ebony spleenwort and purple cliff-brake.

Among other successfully grown although delicate ferns are the cinnamon fern, slender rock-brake and the interesting and unusual walking fern. Wintergreen and partridgeberry add color and interest, especially the latter, whose berries last almost a year. Other suitable plant varieties include African violet, club moss, *Ficus repens*, maranta (dwarf kinds), snakebeard, red mosaic leaf, copper leaf and others.

The surprising thing about these glass gardens is that once planted and well watered, they need practically no attention for weeks. In fact one of these gardens was exhibited at a horticultural show some time ago that had been watered only twice in two years. These gardens will thrive most anywhere except in direct sunlight or heavy shade. Watered every six to twelve months, given ventilation by opening the top ten minutes every few days, they ask nothing else but to be left alone.

In planting terrarium gardens a large handful of charcoal should go in first to keep the soil sweet; then a layer of broken pots or crushed rock to insure drainage; then soil on top of this. An ideal soil is about equal parts of sand, leaf mold and garden loam; more leaf mold if native plants make up most of the planting.

Rocks for miniature hills, streams and pools made of small pieces of mirror, with their (Continued on page 46)



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

SEVEN ECLIPSES THIS YEAR

Some outstanding astronomical events of 1935

By ISABEL M. LEWIS

THE YEAR 1935 will be remarkable, astronomically, for its many eclipses. There will be seven eclipses this year—the greatest number that can possibly occur in any one year—five of the sun and two of the moon. Other interesting happenings will be occultations by the moon of the brilliant planets, Venus and Mars. Both will be visible in parts of the United States. There will also be occultations of the first magnitude star Antares.

On January 5 there is to be about the smallest eclipse of the sun that can possibly occur. It will be invisible to the naked eye because, at maximum, only one-thousandth of the diameter of the sun will be covered by the moon. For only about eight minutes will the moon's shadow graze the earth's surface in a very small part of the South Pacific in approximate latitude 65° South and longitude 110° West. This is undoubtedly one of the shortest eclipses of the sun on record.

On January 19 there will be a fine total eclipse of the moon which will be seen at its best in Asia, Australia, and the Indian and Pacific Oceans, although practically all of the eclipse will be visible in Alaska, the moon setting at about the time the eclipse ends. Part of the eclipse will also be visible in the western states and in western Canada. In northern California, the northwestern states and western Canada the moon will set totally eclipsed, and will set shortly before the total phase of the eclipse in other western sections.

On February 3 there will be a partial eclipse of the sun visible in the morning hours in all parts of the United States, but seen to the best advantage in the eastern and central states. The greatest magnitude of this eclipse will be about 74 per cent; that is, this proportion of the sun's diameter will be covered by the moon at maximum eclipse. This maximum eclipse will occur as the sun rises, on the

Pacific Coast. In the eastern states the eclipse will occur about 11:30 A.M. Eastern Time and its magnitude will be about 40 per cent.

On June 30 there will next be another partial solar eclipse with a greatest magnitude of about 34 per cent. This eclipse will be visible in Arctic regions, at the North Pole, in northern Siberia, Greenland, Iceland, Scandinavia and the British Isles, where the eclipse will occur at sunset.

The finest eclipse and the most interesting astronomical event of the year in this country will be the total eclipse of the moon on July 16. The total phase of this eclipse will be remarkably long, lasting one hour and forty minutes, and from beginning to end the entire eclipse will have a duration of nearly five and a half hours. It will be visible over all of the North American continent, with the exception of the extreme northern part. It will also be visible over all of South America. In the eastern states the middle of the total phase will occur almost at midnight, Eastern Time. Some interesting and valuable scientific observations can be made during this eclipse, including observations of occultations of stars by the moon during the total phase. These are particularly valuable, when made at such a time, for determining the true position of the moon and the irregularities in its contour. The edge of the moon, far from being smooth, is rough and irregular in outline due to its mountains and valleys seen in profile, and it is a great aid in mapping these depressions and elevations to have records of observations of the disappearances and reappearances of stars at the edge of the moon, known astronomically as immersions and emersions.

There will also be another partial eclipse of the sun occurring on July 30. This is a small eclipse with a magnitude of only 23 per cent. It will be visible in the South Atlantic Ocean and Antarctica only.

The last eclipse of 1935 will occur on Christmas Day in Antarctica. It will be an annular eclipse of the sun and the central line of the annulus will pass near the South Pole on the opposite side of it from Little America, where a large partial eclipse of the sun will be visible. A small partial phase of the eclipse will be visible in the extreme southern part of South America, and in New Zealand the sun will rise eclipsed. The path of the annulus, within which a thin ring or annulus of sunlight will be seen surrounding the moon at maximum eclipse, will not touch inhabited land at any point.

Although the solar eclipses of the year are partial and generally small in magnitude with the exception of the annular eclipse, which will probably be unseen by man in its annulus phase, the two lunar eclipses are both fine total eclipses of long duration. Each of them will be seen over more than half of the earth's surface due to the turning of the earth on its axis during the period of the eclipse which brings more of the earth's surface in view of the moon. A most interesting feature of a total lunar eclipse is the fact that the moon never completely disappears from view in the earth's shadow but shines with a coppery light due to the illumination of its surface by light shining through the earth's atmosphere and from the solar corona. Although rated of small scientific value compared to total eclipses of the sun, total eclipses of the moon are always interesting phenomena to observe, and they, at least, have the advantage of lasting longer. A total eclipse of the sun generally lasts only two or three minutes, and at the maximum, which is practically never attained, only seven and a half minutes. A total eclipse of the moon may last as long as one hour and forty-four minutes. The eclipse of January 19 will be total for one hour and twenty-seven minutes and that of July 16 for one hour and forty minutes, within four minutes of the maximum duration possible for any total eclipse of the moon.

On May 5 there will be an occultation of the planet Venus by the moon visible in the evening twilight in the eastern and central states. This will be a most beautiful and unusual phenomenon. Although this occultation of Venus will not be visible in the western states there is to be an occultation of the planet Mars this year on October 31 which will be visible in the evening on the Pacific Coast. This will be almost as beautiful a spectacle as the occultation of the planet Venus. In both instances the reappearance as well as the disappearance of the planet behind the moon will be observable. This is to be a remarkable year for occultations because the first magnitude star, Antares, will also be occulted early in the morning of May 19 in the eastern and central states, and late in the preceding evening in the western states. It will be again occulted in the early evening of July 12 in the eastern and central states. It is unusual for so many fine occultations to be visible under such favorable circumstances in a single year.

On January 2 the earth will be in perihelion, or nearest the sun. This always happens early in January every year and it seems surprising to many people that the earth should be nearest the sun in winter. It may be remembered though that for those who live in the southern hemisphere it is the summer season when the earth is nearest to the sun.

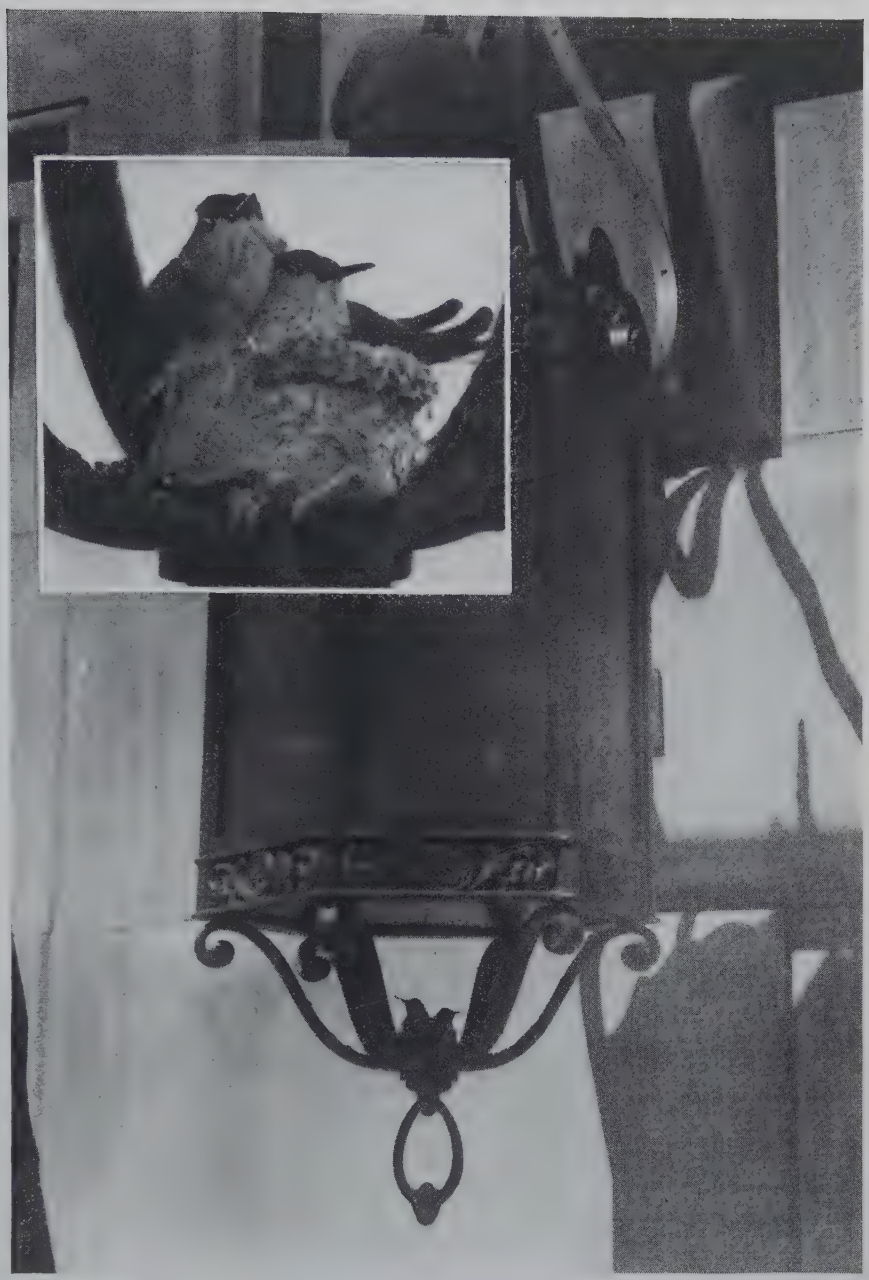
Venus is now in the western evening sky and will be in conjunction with the new moon on January 5, and on January 26 it will be in conjunction with the planet Mercury. Saturn also will be in conjunction with Mercury on January 31 and with Venus three hours later. All three planets will then be low in the southwest in the evening twilight and this will be a fine opportunity to find the planet Mercury which will reach its greatest elongation east of the sun on the following day.

Saturn will be visible in the southwestern sky in Capricornus all of the month, though it is now getting too close to the sun to be seen to advantage. Mars is in Virgo, northwest of Spica, and rises near midnight. Jupiter is some distance southeast of Mars in Libra. Both of these planets may be seen high in the heavens just before sunrise.

Campus Hummers

By M. W. JONES

MEET Punch and Judy, the pair of young broad-tailed humming-birds whose advent on the University of Colorado campus during the summer session raised a mild furore of general publicity, Nature study and photographic activity! And why shouldn't it? To choose for a nest-site a flat space two inches in diameter under one of the ornamental lanterns, which illuminates an entrance of the Union Building, was enough to intrigue human curiosity. For the parents to go about the domestic drama of nest-building, incubation and rearing of their young, serenely and seemingly unperturbed, oblivious of people passing out and in fourteen hours of the day, could scarcely fail to whet the interest of the student body. Many of the people stopped to watch proceedings and examine closely the nest which was barely out of reach from the doorway.



THE YOUNG HUMMING-BIRDS AND THEIR NEST SITE
Snapped by the author and M. H. Buell just before the youngsters took flight. The inset shows the birds about three-quarters life size

As the news gradually spread over the campus, the number of visitors increased. Still, Nature was not to be thwarted and despite the light being turned on every night and the inevitable disturbances attendant on being so much in the public eye, the two eggs hatched in due course. Needless to say, this event did nothing to abate the steadily growing interest. Indeed, a reporter from the campus newspaper "interviewed" the family, named the youngsters Punch and Judy and featured them in a story. The hungry young birds grew lustily, soon filling the nest, flattening and spreading it. A touch of comedy was injected into the situation when, on the day before the fledglings took wing, some lady hung her silk parasol underneath the nest to protect them from possible injury, should they fall out. They had grown so large in proportion to the size of the nest that the latter appeared to afford rather precarious support. Finally, they took wing, almost completely kicking the nest to pieces as they left.

The two pictures show the location of the nest and a close-up of the young birds a few hours before they bade farewell to their nest and all the publicity of their early days. Some idea of the extent of the interest centering around this family of humming-birds was evidenced by the fact that when prints of these pictures were made available at the hostess' office in the Union Building, they were snapped up by the dozen about as fast as stocks could be replenished from the darkroom. Students sent copies of the pictures to friends all over the country.

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JERRY AND JO

FAIRY GUESTS

BY
JANE ADAMS PARKER

Illustrated by Garnet Jex

JO AND JERRY were twins. Perhaps you wouldn't guess it to look at them, for Jerry's little round head was covered with tight black curls, while Jo's was as straight and yellow as molasses candy. They both had sparkling brown eyes, though, and both were nine years old on the fourth of July.

"Aren't you glad we moved up here to Illinois, near Grandpa and Grandma, and Aunt Dot, 'cause down South we never had snow on Christmas?" said Jo.

Jerry looked up through the branches of the big Christmas tree over his head and nodded. "But our Christmas party won't be any good without the cousins," he said, mournfully. "Maybe 'cause you're a girl, you just as soon sit and play with your doll."

Aunt Dot stopped short as she entered the door and looked at Jerry. "Why, what's the matter?" she asked.

"Aunt Grace just phoned Mother that baby Louise came down with the measles this morning. So they can't come," said Jerry.

"And what fun is a Christmas party without anyone to it?" added Jo.

THE BUTTERFLY

Aunt Dot put the cardboard box she held on the table and took off her wraps. Then she asked in a whisper, "Can you keep a secret?"

Jo and Jerry nodded their heads.

"You see, you haven't lived here long enough to know about all the wonderful creatures there are in the woods behind the house. But when your Mother and Uncle Jack and I were little folks, we used to go treasure hunting through the woods all by ourselves. There's a trail that runs from our back gate up and down the ravines, in and out among the trees to Willow Stream. Your Grandpa notched the trees so we wouldn't get lost. Sometimes we were allowed to go across the stone bridge to play near the old mill, and climb in the willow trees. When the grown folks were with us, we'd go way down the trail to an old cabin the hunters built back in the side of the ravine. Now the bridge is gone and only a big rock-pile left. Well, this morning I thought I'd go treasure hunting by myself. And what do you think? When I reached the rock-pile I looked under with my flash-light and found some lovely fairy creatures hidden

away from the winter's cold. So I invited them home with me to your party."

"Really, Aunt Dot?" asked Jo. "Where are they?"

Aunt Dot opened her box and let them peep inside.

"Why they're only old frozen butterflies," said Jerry, disappointed, "that look like dead leaves."

"That's just the underside of their wings," said Aunt Dot. "Now run out and ask Dolly to please give you two bowls of cider. For we surely must give our fairy guests something to eat when they get warmed up enough to fly."

The twins frisked out and were back in a few minutes, with the bowls.

Aunt Dot placed one at each end of the dining-room table. Then they went back to look at the butterflies.

"They're Mourning Cloaks," said Aunt Dot. "In the spring they'll come out to lay their eggs around the twigs of the poplar, willow and elm. When their larval babies hatch out, they'll be velvety, black caterpillars with orange-red spots along their backs. And they'll grow big on the leaves."

"Look," said Jo, "one's beginning to flutter its wings."

"They might play they were dead, if you touched them," said Aunt Dot. "It's a little trick they have."

"See, there goes one—and another," exclaimed Jerry delightedly.

Just then the door opened, and Grandma and Grandpa, followed by Mother and Daddy came into the room.

"Merry Christmas," they shouted.

"And Christmas surprise," sang Jo and Jerry together.

As they spoke the room seemed suddenly full of beautiful fairy creatures fluttering about. And what do you think? But when they were all seated at the Christmas dinner-table, the fairy guests flew down to sip the cider.

Grandpa's eyes twinkled, as he looked at the twins. "There are lots more treasures hidden away in our old woods," he said, "if you only know where to look for them."

"Please show us how to find them," said the twins.

•

Orion's Jewels *By* JEAN H. BROWN

Upon Orion's shoulders,
As jewels made to please,
There shines the dazzling Bellatrix
And lovely Betelgeuze,
And there's the royal Rigel,
So plain that we may see
It sparkling bright throughout the night,
Like a buckle on his knee.

•

NOTE: Most books on astronomy place Rigel in the foot of the giant. For poetic reasons, which we trust astronomers will pardon, we have placed it in his knee.

The Seven Stars of the Dipper

A Seneca Indian Myth
Retold by DOROTHY E. PLETCHER

LONG AGO, six Indians started out on a hunting trip far from their village. They travelled for many suns. That is the Indian way of saying that they travelled for many days. But they found no game.

One of the Indians, who was really only lazy, pretended that he was sick. And so they made a stretcher for him out of two poles and some hide. Four men carried him on this. The sixth hunter walked behind the others, carrying the kettle.

Just when they had become very, very hungry, they saw the footprints of a bear. Quickly they dropped everything they were carrying—even their sick friend—and began to follow the bear's tracks.

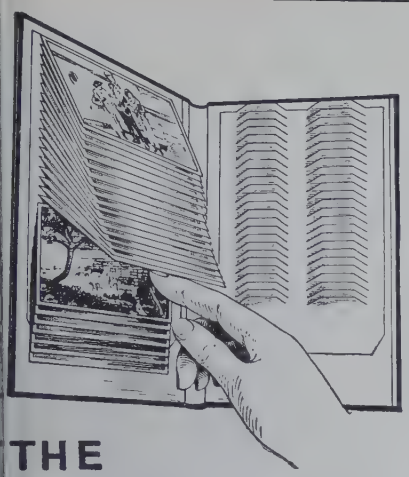
They ran and they ran and they ran. Each day they thought they would catch up with the bear. But it seemed that they had to travel further and further. Still the bear was not in sight. Now, it happened that the lazy Indian who was dropped was able to run very fast because he was more rested than his friends. He ran past them, caught up with the bear, and killed it.

But what do you think was happening all the time? As this Indian and his friends were chasing the bear they never noticed that they were going up toward the sky all the time. People on the ground saw them going up and up and up. They kept rising as they ran. By the time they caught the bear they had reached the sky. And they have stayed there to this very day. We can see them in the sky near the Polar Star. They are the seven stars in the Dipper.

You can see the man who carried the kettle in the bend of the Great Dipper, the middle star of the handle. The only small star near any of the Dipper stars is the kettle. And the bear? You will see him as a star at the lower outside corner. Some starlit night, are you going to look for the six Indians, the bear and the kettle? When you do, remember how the Seneca Indians explain them.

•

For the first time you have met Jerry and Jo in the story that starts the Uncle Dick Department this month. You will hear more of them and the various treasures that they find along the trail. Perhaps their discoveries will suggest to you many things that you can find along some trail through the woods and fields near your own home. There are many things to be seen but it is only the bright eyes that spy them out. Jerry and Jo have bright eyes and if you enjoy their adventures along the trail, Uncle Dick will be glad to hear from you about them.



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Dr. Pearson Retires

After many years of service with the National Association of Audubon Societies, Dr. T. Gilbert Pearson has announced his retirement from the active grind of the presidency. He has been elected by the directors to the post of President Emeritus, which will enable him to continue to serve the Association, but also to devote much of his time to international activities, lecturing and writing. Kermit Roosevelt has been elected president and John H. Baker, chairman of the board of directors, was chosen as executive director.

An International Appeal

A striking and splendid appeal for international activity to stop the tremendous wastage in the life of wild fowl through the practice of polluting waters with oil is made by the Massachusetts Society for the Prevention of Cruelty to Animals in a pamphlet entitled *An International Appeal.* NATURE MAGAZINE has sounded the same note on a number of occasions during the past few years. The tremendous loss of bird life through this means is not realized by many because they do not see it, but it is rapidly increasing. It seems that our wild fowl are beset on every hand and international cognizance must be taken of this problem. It is understood that the ill-fated *Morro Castle* contains much oil within her hold. This, when the vessel breaks up, as she is likely to do with the first severe storm, will spread oil on waters much frequented by water birds. It will also eliminate Asbury Park as a place to bathe in the sea for a long time to come.

Nature Lectures

During the past summer William L. Finley, noted wildlife photographer and lecturer and Director of Wildlife Conservation of the American Nature Association, has been gathering new motion picture reels preparatory to his annual winter lecture tour in the East. "Where Rolls the Oregon" is the title given to his new lecture and for it he draws upon the wide and varied wildlife resources of that State in which Mr. Finley lives. Other lectures in the Finley Nature Series include "Birds, Bergs and Kodiak Bears," "Camera Hunting on the Continental Divide," "Getting Personal with Mountain Lions" and "Wild Animal Outposts." Mr. Finley will be in the East during January and February.

Bird Notes

In a revised and more complete new edition, Harry L. Rhodes has brought out his *Bird Notes* again, following an enthusiastic reception of the first edition. Mr. Rhodes is an ardent bird lover and student of the avian world, and his enthusiasm is carried into this little book. He deals with the birds known to Kansans. He has also drawn upon the most pertinent comments of other bird students, and the careful selection of these comments reflects a wide reading of published bird literature. The book is sold by Miss Margaret Whittemore, 1615 College Ave., Topeka, Kansas, for $1.50.

WINTER WARMTH

Each winter the Santa Fe carries a great many people to California and southern Arizona.

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Hiking and Camping Forum

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Brevities

The Washington Alpine Club staged a Christmas Greens hike December ninth. Only approved evergreens were collected. The wards of a Seattle hospital will be more cheery this Yuletide, thanks to the W. A. C. . . . A waterproof vest, literally "alive" with pockets, slips over the head by a neck strap. The garment is patterned like a short apron, with a taped waist. An outsize pocket automatically becomes the owner's map repository. . . . "Bring drinking water in cup" is a command which will severely test the juggling powers of those taking a certain Middle-West club trip. Is it a primary lesson in rock climbing? . . . The Georgia Appalachian Trail Club recommends that the U. S. Forest Service take over and preserve those parts of the Appalachian Trail using government lands. They have also asked Mr. Farley to issue an Appalachian Trail postage stamp. Why stop here, when we might have mileage cancellations thrown in for our three cents? . . . The free booklet issued by a rubber footwear company contains some good camping hints for beginners. . . . November issue of the *Sky Line Trail* is a pictorial feast of the Canadian Rockies. It is devoted to the official 1934 hike of the Sky Line Trail Hikers, an organization under the wing of the Canadian Pacific Railway. . . . A monthly breakfast trip brings out the early rising members of the Glendale Community Hikers, California. Each member supplies his own food and utensils. A handy campsite is chosen. . . . A stylish jacket of stormproof flannel has a convertible parka hood. The maker mentions a "concealed zipper," yet the picture shows it otherwise. Who cares whether the zipper shows or not? . . . Each Fresh Air Club hike is in command of a Captain. A useful man to have when navigation problems arise on a robust F. A. C. cross-country hike. . . . With the current quarterly issue, annual subscription of *Trails Magazine* is reduced to 30 cents. Southern California is the terrain of this periodical, sponsored by the Los Angeles County Department of Recreation, Los Angeles. . . . "A work trip on the worst section of the Appalachian Trail" was the blunt recruiting SOS used by one large club. . . . California Alpine Club returned to the "gold standard" in mid-November, when they explored Coloma, where California's first gold was removed. . . . Staccato descriptions of past hikes are Editor Margaret Bohman's specialty, in the Maryland Appalachian Trail Club's bulletin.

Keep Out the Snow and Rain

Even the nearest approach to a 100% waterproof boot—heavy rubber bottoms with leather tops—will fail you if the tops are exposed. Water drips from the cape or coat on to the legs, thence finds openings through the narrow space between hose and boot tops. Preparedness is wearing either a second or third pair of hose, tightly rolling the cuffs over the boot tops. You also get full protection when you flop into a creek or wade through deep snow.

According to the *Georgia Mountaineer* (Georgia A-T Club), horsehide leather is used in most cheap boots. The sweat pores in the leather act as leaks. Close the openings with two separate coats of castor oil, applied with a brush. One coat will be sufficient for each subsequent occasion.

A waterproof tent, as experienced campers know, will shed water if touched by human hands during a storm. On the same principle a waterproof garment will soak your back, right through to the skin, if a heavy knapsack presses against it. Pack friction is also hard on the garment, shortening its period of usefulness. Wear the pack *under* the waterproof cape or coat.

Fewer Food Containers

You need more food and clothing on winter trips. Is there any way of curbing the merciless twins—heavy pack and heavy footing in the snow? Yes, the number of tin and glass containers for staple foods can be reduced.

Cocoa makes a nourishing, fattening brew—and you want lots of it. Need three separate containers of the makings be carried? No. One will be sufficient if the powdered rations are prepared at home, as follows: one teaspoonful of cocoa and two teaspoonfuls each of granulated sugar and dried milk. On arrival at camp the desired number of rations can be mixed with a little cold water, before being put in the pot to boil. Allow a cup of water to a ration, and stir in the pot until the powdered milk is thoroughly absorbed.

Making Camp Under Difficulties

The research department of a medical firm recently discovered a new use for its bandage. Let's take the hypothetical case of a party headed for a certain campsite by nightfall. The trek proves more arduous than was anticipated, and they are too fatigued to continue. They will camp where they are, but there is no known water for several miles. Rather than suffer for lack of water, a volunteer decides to make the forced march by bandaging his legs. His physical activity is thereby stimulated, increasing the blood supply to vital centers. In an hour or two he returns to his companions with the precious liquid. Joy reigns around the camp fire.

Middle-West Winter Hikes

A club's stamina depends on the membership reaction to winter trips. Although it is open only to members, the Christmas Tree Hike of the Black Hawk Hiking Club usually attracts a three-figure attendance. Below zero weather last January and February did not curb hiking enthusiasm, for the turnouts ranged from 46 to 64.

On a winter trip the campsite decides the swing of the pendulum between misery and comfort. No one enjoys the halt in an exposed position, with gusts undoing the fire's good work. Black Hawk leaders usually seek an airless, protected hollow, preferably with fallen logs handy to serve as benches. John H. Hauberg is president of the Black Hawk Hiking Club, which is a tri-city and Interstate organization—Rock Island and Moline, Illinois, and Davenport, Iowa.

Colorado Explorations

Some exceptionally valuable articles graced the pages of *Trail and Timberline*, monthly magazine of the Colorado Mountain Club, during 1934. In the November issue, for example, Chairman W. L. L. Scott of the C.M.C. Exploration Committee, described a preliminary aerial survey of the Lodore Cañons.

Next season, on foot and with ropes, this inaccessible part of Colorado will engage a C.M.C. exploration party. Archaeological discoveries are virtually assured, as a vast cave, in all likelihood the home of ancient cliff dwellers, was glimpsed through field glasses from the survey plane. *Trail and Timberline* is available to non-members for $1.50 yearly. The address is 422 Chamber of Commerce Bldg., Denver, Col.

Organized Walks in Boston

A varied program of activities is conducted by the Field and Forest Club of Boston. Although established in 1904, Sunday rambles were not started until 1933. One a month is scheduled. Corresponding Secretary Arnold H. Conza reports the all-day Sunday trips are particularly popular during the late fall and winter, when the afternoons are so short. Saturday afternoon rambles predominate on the schedule, which also presents evening and holiday walks, lectures and other social events.

This club maintains the Mid-State Trail, 22 miles long, at elevations from 700 to 1500 feet, from Mount Wachusett to Watatic Mountain, all in Massachusetts. A map is available from the F. and F. C. Dr. Ralph C. Achorn is president of the Field and Forest Club, which has a membership of 1000.

Echoes of Club Trips

Numerically small, the New York Mountain Club is rich in humorists. Their vehicle is *The Echo*, a mimeographed paper. This is a club of strenuous hikers—the kind who can take it—and come back for more. How's this for adventure: "We amused ourselves in the morning by taking every unmarked trail that left the one we chanced to be on."

"The best way to get a fire is to smoke the others out," was the way in which an early riser on a week-end camping trip 'fessed her limitations. Editor Elizabeth M. Staats follows the policy of every leader writing his or her "slab" of the club log. She has them so well disciplined that, when a leader was unable to conduct her trip, an imaginary account of it reached Miss Staats the following week!

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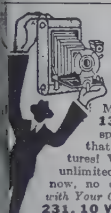

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THE TEN-YEAR INDEX

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Credit Is Due

In republishing in our October issue the splendid graph showing the waterfowl situation we gave credit to its author, Clifford Sakry of St. Cloud, Minnesota, and to the *St. Paul Pioneer-Press* for publishing it. It develops that Mr. Sakry is a member of the staff of the *St. Cloud Daily Times,* and it was in that paper that the graph first appeared. It is the property of that excellent newspaper. In that connection may we also record a letter from Cyril W. Plattes, first vice-president of the Minnesota Game Protective League, in which he expresses high appreciation of the graph and adds: "May I congratulate you on the progressive and courageous attitude of NATURE MAGAZINE in crusading the true cause of waterfowl conservation. Though victory may be lost more times than won, our battle must be eternal."

Rural School Leaflet

The latest number of the Cornell Rural School Leaflets to come to hand is the Teachers' Number, which is Number 1 of Volume 28. Following a prefatory article in which Dr. E. Laurence Palmer, Professor of Rural Education, traces the development of school science, the leaflet provides suggestive material to aid the teacher in carrying on the year's work. The leaflets are available on a subscription basis outside the State of New York and the price is only a fraction of their real worth.

Humane Trap Contest

For the eighth consecutive year the American Humane Association, 80 Howard Street, Albany, N. Y., will hold a humane trap contest. Prizes ranging down from $150 will be awarded in various classes. The aim of the contest is to develop traps that will minimize suffering on the part of the trapped animals. The contest closes April 30, 1935, and full details may be obtained from the Association.

Interesting Poems

We are not particularly poetry-minded and we do not regard ourselves as qualified to render critical judgment on a book of poetry. We do, however, know what we like, and we also confess to a dislike for most of the poetry that abandons all semblance of poetic form. It seems to us that much of it lacks the sincerity inherent in most literary stunts. Then along comes *Deaf Walls,* a book of poems by Edmond Kowalewski. We have read these poems and believe that here lies the exception to collections of poems departing from conventional style. There seems to be, behind these writings, an active and sincere mind, boasting a philosophy and vision, and these are brought to life glowingly. We confess there are spots which puzzle us a bit, but that is no doubt due to our admitted lack of ability to judge poetry. We do believe, however, that this book of Mr. Kowalewski's poems will find a welcome among those who love this form of expression. The publishers are the Symphonist Press and the price of this volume is $2.

R. W. W.

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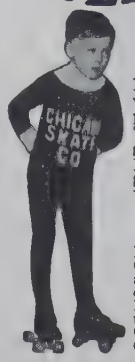

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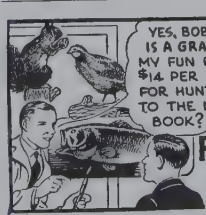

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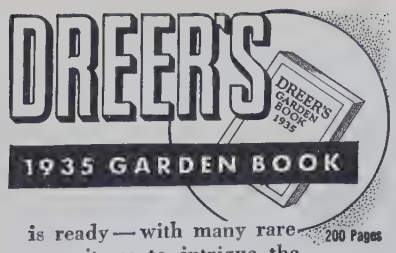

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INDOOR GARDENING

(Continued from page 36)

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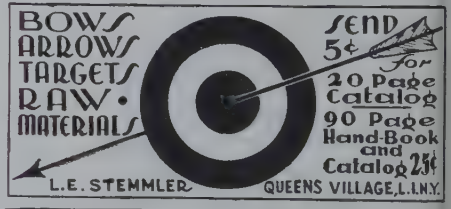

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OUR FORTHCOMING CAMP DIRECTORY

will include many of the better camps. Some of the following camps have been in our Camp Directory since it was established. Others will appear for the first time this year. Any will be glad to send you booklet and full information if you will mention Nature Magazine when you write the director at his winter address, which follows his name in this list.

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TIMANOUS, Raymond, Me. Mr. and Mrs. J. Halsey Gulick, 103 Carrington Ave., Providence, R. I.

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OUTLET, Old Forge, N. Y. Dr. George H. Longstaff, 8932 Clinton Ave., Jamaica, L. I., N. Y.

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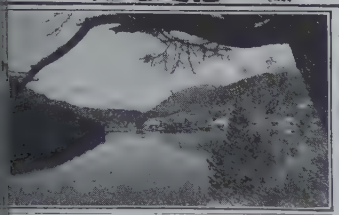

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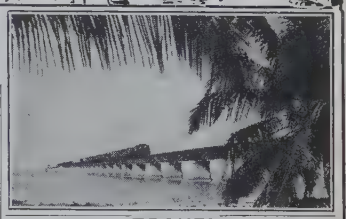

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Photographic Notes

BY SAMUEL BROWN

It seems quite surprising, when one stops to realize, the part that chemistry plays in the attaining of certain results in photography, beside that of development and printing. For extreme enlargements fine grain development is not only desirable, but essential. In printing, contrast, color and tone can be controlled and afterwards the finished print may be so toned, dyed and manipulated as to appear to be a natural color picture.

Quite some interest has sprung up among the nature picture takers in connection with developing and printing, and particularly in toning. In response to the interest shown we feel the following is timely and appropriate.

In addition to the reducing agent (in the developer) there is usually sodium sulphite which absorbs the oxygen that would otherwise oxidize the reducer; the sodium carbonate swells the gelatine allowing the reducer to act; potassium bromide prevents fog.

There are a number of reducers, each one giving a different result. Metol (elon, pictol) develops fast and builds up detail slowly (specially recommended where soft results and gradation are desired or where it is certain that negatives are overexposed). Hydroquinone works slowly and produces extreme contrast. It is usually used with metol to give a balanced developer. Diamine (paraphenylene-diamine) when used with a large amount of sulphite develops in very fine grain.

A very good all-around developer that is safe for negatives and contact and enlarging paper is as follows:—

Water	16 ounces
Metol	45 grains
Sodium Sulphite	1½ ounces
Hydroquinone	175 grains
Sodium Carbonate	2¼ ounces
Potassium Bromide	27 grains
Water to make	32 ounces

For use with contact paper, dilute stock solution 1 part, water two parts; bromide paper and films, stock solution 1 part, water four parts.

This developer is available already mixed in tubes, or as a liquid, and even in tablets, and is usually sold as M. Q. developer.

Color

A winter scene toned blue, a woodland scene toned green, or a mat of colored flowers toned and stained in their respective colors speak for themselves the worthiness of the trouble one goes to to get these results.

The processes are simple and the following notes should serve for your guidance.

(1) Prints should be exposed so that development will be full and complete (development of contact paper should be standardized at 45 seconds; bromide paper at 2 minutes). Weak, half-developed prints give washed out tones. (2) Fix the prints correctly and (3) wash them so that all hypo is eliminated. If you take care to do this you will get nice results.

SUCH VIEWS AS THIS ARE INTERESTING AND POSSIBLE DURING FEBRUARY. TAKEN AT F.11 AND 1/50 SECOND

We might mention that prints to be toned should not be fixed in an old fixing bath, or one that has been used for several other prints, because a used fixing bath contains dissolved silver which attaches itself to other prints fixed therein. This silver, of course, will tone and produce what look to be stains. Avoid a strong acid hardening and fixing bath if possible.

While glossy surfaced papers sometimes yield beautiful results, we do not recommend them for toning; matt or semi-matt papers are easier to work with and give more uniform results.

When toning one or two dozen prints blue or green, it is best to proceed as follows: take a print and cut it into three strips and mark them 1, 2, and 3. These are put into the toning bath and the strips are taken out in their order 1, 2, and 3, after 20, 30, and 40 seconds respectively. The strips are then washed for five minutes and dried between blotting paper. Then the tones are judged and the batch is done according to the best time shown. Do not judge the tones while the prints are in the toning solution as the color shows up best during, and after, washing from ten to twenty minutes.

Prints to be stained should also be prepared as directed above. After they have been well washed, prints should be blotted off and then placed, for a short time, in the staining solution, after which they may be reblotted and allowed to dry.

Double Toning

The employment of toners for producing two or more color effects adds a new fascination to photography. The multiple toning is accomplished with the aid of a spirit varnish which is used to cover those portions of the print that are not intended to take the color of the particular toning bath in use, one color being produced at a time. By the method described below, it is easy to achieve first-rate results.

A good, plucky print is made from a suitable subject. Assume that the colors selected are sepia and green. Apply the varnish with a camel hair brush to those parts of the print which it is not desired to tone sepia. When the varnish dries, proceed to tone sepia in the usual way. Dry the print and remove the varnish with cotton wool dipped in methylated spirit. Then varnish all but those portions which it is desired to tone green. When the varnish is dry, tone as before and remove the varnish. Now with a few touches of other colored stains, the print is finished. Judicious selection of subject and color will result in many pleasing effects by this method.

White shellac is good to be used as a varnish; remove it with denatured alcohol.

All the articles (developers, reducers, toners, stains, etc.) described in these notes are available at photographic supply stores already compounded in powder, liquid or tablet form. For those who wish to compound their own solutions, the author has in his files many formulas that he will be glad to pass on. Also any questions concerning photography will be answered if stamped, self-addressed envelope is forwarded.

Cordially,
SAMUEL BROWN.

Gentians on a Beach

A rather unusual behavior on the part of nged gentians is reported by Dorothy stal of Indianapolis. This last summer ile vacationing on the Leelanau Peninsula Michigan, she came upon a colony of se lovely flowers growing on the rocky d gravelly beach of Grand Traverse Bay. e colony stretched for some two hundred ds and was profuse. The trees were about y feet back from the shore, so that the ntians had chosen and prospered in an en-ely unshaded and rather inhospitable place far as soil was concerned. A species of denrod, a few cardinal flowers and a tiny le-blue blossom which Miss Vestal could t identify grew among the gentians.

Girl Scout Work

Tent caterpillars had a bad time in West ringfield, Massachusetts, last summer and t community should be greatly the win-r in terms of tree foliage next summer. ght troops of Girl Scouts conducted an ensive drive on these pests, with prizes r the best troop and best individual accom-shment. Troop 14 collected 6035 egg sses and went off with first honors, Mrs. B. Pierson, Nature examiner of the local ops, reports. Incidentally, Mrs. Pierson's ughter won first individual prize with a al of 2593 egg masses. A total of about 0,000 masses was collected and destroyed.

Trap Law Beaten

We regret to report that the Massachu-ts law regulating the use of the steel trap s defeated in referendum at the recent elec-n. The issue as put was ambiguous and is felt that many who voted in the affirma-e thought that they were voting for the ention of the law, although such a vote s against it. This is a step backward in r progress toward conservation of wild e and humanity toward that life. We are rprised that Massachusetts, of all states, k that step.

California Cats

What to do about cats and their bird-ling proclivities is an issue troubling both sadena and Newport Beach, California. In e former city the Audubon Society has ked for an ordinance requiring the con-ement of cats to the premises of their ners and permitting those bothered by s to destroy them. The City Manage. has t been successful in figuring out a regu-ion that will solve the problem. In New-rt Beach a license fee of one dollar a year r cats has been adopted.

WINTER SPORTS

Courtesy New England Council

Winter Comes to New England

WEATHER FORECAST: Snow in New England, the Adirondacks and Canada! This news produces two kinds of activity among the residents of the snow belt. Your sun-worshipers or cold weather dodgers—whatever you wish to call them—storm the steamship offices for information on winter cruises—rates, itinerary and dates of sailing.

Another group—and one that is growing in numbers by leaps and bounds—scurry around with a happy glint in their eyes, getting skis, skates or toboggans in readiness for a week-end in the regions where the snow remains fresh and unsullied and the slopes provide for thrilling adventures.

Balmy southern breezes may be all very well, but for sheer joy of living, of breathing exhilarating air, of scudding down steep slopes on skis or toboggan, of riding behind a pair of prancing horses with jingling sleigh-bells and the crunch of steel runners as they glide over the snow, there is nothing like a week in the regions of winter sport.

In the east particularly there has been a tremendous development in winter sports. Probably the three most important factors in bringing this development about have been, briefly, ski-running, the C.C.C. and "snow trains."

Ski-jumping is an art arrived at by only a few, but ski-running requires no unusual skill. All that is required are steep slopes, a sense of balance and some elementary instruction in the position to assume.

The Civilian Conservation Corps have opened up regions and woods which in the past have been inaccessible.

Many of the eastern cities have started the practice of running special "snow trains" whenever the weather promised a week-end of snow. From New York City, from Boston, from Worcester, Springfield and other eastern cities weekly specials are becoming an institution. Some of them are for the period of weekends and others for one day only, but they serve to convey your winter sports devotee to the Berkshires, the Adirondacks, to the White or Green Mountains, or to Montreal or Quebec where facilities for snow sports are abundant.

People have discovered that in New Hampshire they have a real American Switzerland. The Green Mountains, the Berkshires and the Adirondacks are conveniently close to the large centers of population.

Montreal, Quebec, the Laurentians, all historic places that are chock-full of quaint sights, constitute the Province of Quebec's winter playgrounds, and are gay centers of fun and hilarity.

Montreal, with its six-chute toboggan slide on historic Mount Royal, and Quebec, with its triple-chute toboggan slide on world-renowned Dufferin Terrace, attract more and more people each winter.

If you require any particular information on special localities where winter sports are offered, or on the schedule of "snow trains," write to the Travel Bureau of Nature Magazine and we will be glad to supply you with this information.

TRAVEL BUREAU
1214 Sixteenth St., N.W., Washington, D. C.

I am interested in winter sports. Send me information on the following regions:

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THE SPIRIT OF SERVICE

THE value of a nation-wide telephone service, under one unified system, is reflected in the day-by-day efficiency of your own telephone. It is given dramatic emphasis by an emergency.

Several years ago, the worst sleet storm in telephone history swept north from Texas almost to the Great Lakes and ravaged a section 150 miles wide. Thousands of telephone poles were broken. Thousands of miles of telephone wire were snapped by the weight of clinging sleet. Telephone communication throughout the country was affected by this gap in the Middle West.

To restore the service quickly was beyond the power of the local telephone companies. Had they been forced to tackle the job alone it would have taken months and imposed a heavy financial burden. Instead, the full resources of the Bell System were thrown into the breach. From the Southwest from New York, Pennsylvania, Ohio and the North west, the repair trucks started rolling into the stricken area.

Even while men were on their way, the warehouses of the Western Electric Company started shipments of tools, wire, poles, cross-arms and other needed equipment. It was only because of standardized material and standardized methods that the emergency was met and service quickly restored.

Telephone service as you know it today would be impossible without the unified Bell System.

The Western Electric Company is the manufacturing, distributing and purchasing organization for the Bell System. Centralized activity of this kind means better quality at lower cost.

BELL TELEPHONE SYSTEM

FOR OUR HAWKS

New Sanctuary Emphasizes Their Value

WE HAVE, on many occasions, pleaded for hawks, among the most unjustly persecuted of all our birds. Year after year we have seen organized hawk-killing campaigns born of ignorance, or, worse, fostered by merchants and manufacturers dealing in arms and ammunition. We have read charges brought against the hawks, accusing them as "vermin" and basing these allegations on hearsay and incompetent evidence. We have seen pleas for campaigns to kill off a certain species of hawk when even trained ornithologists cannot always be certain which species is which when on the wing.

In the face of this activity on the part of those who want an excuse to shoot something or who wish to increase the market for things to shoot with, we cite proved evidence about our hawks. Scientific analysis of the dietary habits of these birds has established beyond question that most of them are vastly beneficial. While a few species occasionally take a domestic fowl or a game bird, their main sources of food are the smaller rodents that do so much harm to the farmer. In their choice of food, hawks play their part in Nature's scheme of check and balance.

One instance is illustrative of the fallacy of the vast majority of the charges against hawks. Sportsmen in a certain section became aroused by the claim that a group of some thirty marsh hawks were wiping out the quail population. A campaign to exterminate the hawks was demanded. Analysis was made of one thousand hawk meals, however, and in four instances the remains of a quail were found. In more than nine hundred meals one or more cotton rats were found. Cotton rats are very destructive to the eggs of quail.

Yet malicious misinformation about our hawks continues to be widely spread. While some state laws protect certain hawk species, they are not enforced and great numbers of the protected species are killed through ignorance or indifference. In the process, the numbers of these graceful, daring and intelligent birds have gradually diminished, in the case of some, the interesting and beautiful species, close to the vanishing point.

It is this mistaken attitude toward hawks, moreover, that permitted such an outrage as that at Blue Mountain, Pennsylvania, described by Mr. Collins elsewhere in this issue. And we are reiterating our plea for our hawks here in order that we may record the establishment of the first hawk sanctuary and pay tribute to Mrs. C. N. Edge and the Emergency Conservation Committee for carrying its establishment through to its present point.

In the face of threatening gestures by thwarted slaughterers, and legal writs, an option was obtained upon this vantage point from which congregating birds have been senselessly butchered every year. A deputy and a warden stood their ground against angry men who felt themselves cheated out of their "sport". But for the first time in many years the hawks passed safely on their way South.

The work, however, is not done. The mountain, more generally known as Hawk Mountain, must be purchased and preserved in perpetuity. The property will be conveyed by Mrs. Edge to five trustees who will administer it as an inviolate sanctuary for *all* wild life. The details are now being worked out, and it is probable that this will be named for some individual who has led the way in the field of true wildlife conservation.

In the meantime contributions are needed to assure the preservation of the mountain. It is not our custom, least of all on our editorial page, to urge contributions to projects, conservation or otherwise. We do not hesitate, however, in this instance. Hawk Mountain must be set aside, not only for the tremendous conservation good it will do, but because it will stand as a symbol of the consideration which our hawks so richly deserve. There are many other slaughter points along the migratory routes of these birds. These should be located and either policed under existing laws or similarly set aside. In the meantime the Hawk Mountain project requires support, and information may be obtained from, and contributions may be sent to, the Emergency Conservation Committee, 734 Lexington Ave., New York City.

FAST AS THE ANTELOPE SPED, THE AIRPLANE ABOVE CAUGHT AND PASSED THEM

A herd of pronghorn antelope on the ranch of Charles J. Belden in Wyoming. The photograph was taken by Mr. Belden from the plane piloted by Mr. Pack. Fleet of foot, the animals can attain a speed of between forty and fifty miles an hour but the great, noisy bird above them was faster. Later, three of the youngsters of the herd were to take the air route to the west, wild pioneers of the air